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THE MUTILLID WASPS OF THE GENUS *TIMULLA* WHICH OCCUR IN NORTH AMERICA NORTH OF MEXICO*

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The Mutillid wasps discussed in this paper form a part of the genus *Timulla* Ashmead. The species of this genus occurring in North America north of Mexico have long been a problem to students of Mutillidae not only as to their generic affinities but especially with regard to the recognition, diagnosis and relationships of the various species. The latter difficulty has been especially acute in the case of the female sex. The two sexes are so different in appearance that they have been described as different species and the two sexes of a single species have been correlated heretofore in only a few instances. The identification of the described females has been exceedingly difficult on account of the failure to recognize the morphological criteria by which they may be separated. This state of affairs was well expressed by Bradley (1916) as follows: "The only character by which I have been able to separate the females is the shape of the thorax, and this cannot be expressed in a key with sufficient exactness to make it probable that it can be used for identification of specimens without a series for comparison. The structure of the pygidium varies from entirely smooth to granular and through various stages of wrinkling to rugose. I cannot conclude that its differences are specific; nor are those found in the carina of the petiole."

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During the past eight or nine years I have been able to bring together several thousand specimens of this genus collected in the United States and Canada. A study of this material has shown that the species can be readily separated in the female sex and that several of the species of males previously thought to represent single species were in reality composite and represented two or more species or subspecies. A number of nomenclatorial problems have been encountered which made the study of the type material imperative. All of the type specimens have been seen with the exception of the species described by Say. The types of Fabricius, Lepeletier de Saint-Fargeau and F. Smith were examined while studying in Europe as a Fellow of the John Simon Guggenheim Memorial Foundation. It was found that the two species described by Fabricius had not been recognized as belonging to this genus and the one described by Lepeletier had been misidentified. I have also studied the types of all the species described from Mexico since the species occurring in Texas, New Mexico and Arizona undoubtedly extend their distribution to a greater or less degree into that country and duplication of descriptions of the same species might possibly exist.

The results of the study of the material mentioned above are presented herewith and include keys for the separation of species adapted for each sex; nomenclatorial changes resulting from the correlation of the two sexes and other causes; historical synonymy for each species; description of new species and subspecies; maps indicating the geographical distribution of many of the species; figures illustrating certain salient characters of the males; a bibliography of the literature pertaining to the species treated, and certain other minor notes.

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University, Ithaca, New York; University of Kansas, Lawrence, Kansas; University of Michigan, Ann Arbor, Michigan; University of Colorado, Boulder, Colorado; University of Nebraska, Lincoln, Nebraska; Ohio State University, Columbus, Ohio; Emory University, Emory University, Georgia; University of Arizona, Tucson, Arizona; Boston Society of Natural History, Boston, Massachusetts; Entomological Branch, Canadian Department of Agriculture, Ottawa, Canada; Kansas State Agricultural College, Manhattan, Kansas; Oklahoma Agricultural College, Stillwater, Oklahoma; New Mexico Agricultural College, Las Cruces, New Mexico; Colorado Agricultural College, Fort Collins, Colorado; North Carolina Department of Agriculture, Raleigh, North Carolina; Texas Agricultural College, College Station, Texas; South Dakota Agricultural College, Brookings, South Dakota; Oregon Agricultural College, Corvallis, Oregon; Connecticut Agricultural Experiment Station, New Haven, Connecticut; Bureau of Plant Industry, Pennsylvania Department of Agriculture, Harrisburg, Pennsylvania; Clemson College, Clemson College, South Carolina; Mississippi College of Agriculture, Agricultural College, Mississippi; Tennessee Agricultural College, Knoxville, Tennessee; Montana Agricultural College, Bozeman, Montana; Utah Agricultural College, Logan, Utah; Mr. C. N. Ainslie, Sioux City, Iowa; Professor O. A. Stevens, Fargo, North Dakota; Dr. W. C. Stehr, Athens, Ohio; Dr. J. Bequaert, Cambridge, Massachusetts; Mr. Roy Latham, Long Island, New York; Mr. A. C. Burrill, Jefferson City, Missouri; Mr. B. E. Montgomery, Poseyville, Indiana; Mr. W. W. Jones, Douglas, Arizona; Dr. Harold Morrison, Washington, D. C., and Mr. H. B. Parks, San Antonio, Texas.

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Genus *Timulla* Ashmead

Mutilla subgenus (*Mutilla*) (Division I) Blake, Trans. Amer. Ent. Soc., vol. 3, 1871, p. 227.

Mutilla (Division I) Blake (part), Trans. Amer. Ent. Soc., vol. 13, 1886, pp. 194, 281.

Mutilla Cresson (part), Trans. Amer. Ent. Soc., suppl. vol., 1887, p. 263.

Timulla Ashmead, Journ. New York Ent. Soc., vol. 7, 1899, p. 55.

Mutilla (group *hexagona*) Fox, Trans. Amer. Ent. Soc., vol. 25, 1899, p. 269.

Mutilla (Division I) Blake (part), Trans. Amer. Ent. Soc., vol. 42, 1916, pp. 199-214.

Genotype.—*Mutilla dubitata* Smith, only species originally included by Ashmead.

Diagnostic characters of males: Eyes large, strongly ovate, deeply emarginate within; first abdominal segment small and gradually dilated to the apex, completely sessile with the second segment, not at all transversely developed; tegulae large, conchiform; vertex rounded throughout, not elevated nor flattened, punctate throughout, not at all longitudinally striato-punctate; felt lines present on second abdominal tergite only, not present on the second sternite; distance between origin of vein M on vein R and the base of the stigmatic cell equal to or less than the length of the latter.

Diagnostic characters of females: Eyes strongly ovate; first abdominal segment small and gradually dilated to the apex, completely sessile with the second, not at all transversely developed; dorsum of thorax rectangular in outline; pygidial area present and well-defined; second abdominal tergite maculated with two spots or lines of pale glittering pubescence.

The genus *Timulla*, as defined above, not only includes all the New World species for which the genus was erected, but also those species belonging to *Trogaspidia* Ashmead which occur in Africa, Asia, Australia and the Islands of the Pacific Ocean. I have pointed out (1933) that no structural basis has been found that will serve to separate *Trogaspidia* from *Timulla*, although no intensive and critical study has been made to discover such characters. The genus *Trogaspidia* was originally erected to include certain African species in the male sex which have the scutellum gibbose rather than evenly convex, but many Asiatic species assigned to this genus have the scutellum evenly convex, while certain South American species assigned to *Timulla* have the scutellum gibbose. I am therefore retaining both names for the present as subgeneric categories of the genus *Timulla*, the subgenus *Timulla* to include the New World species, and the subgenus *Trogaspidia* to include the Old World species.

Subgenus *Timulla* Ashmead

As early as 1836 Thomas Say recognized that his species *hexagona* together with one or two others differed from other North

American Mutillidae in having emarginate eyes, but assumed that they belonged to the genus *Mutilla*, an Old World genus, and described them as such. Later, Blake (1871) proposed to separate the North American species of *Mutilla* into two subgenera, i.e., *Mutilla* for those with emarginate, ovate eyes, and *Sphaerophthalma* for those with circular, non-emarginate eyes. The subgenus *Mutilla* was again subdivided into two divisions, the first including those with the first abdominal segment small, but gradually dilated to the apex and completely sessile with the second segment (the species discussed in this paper). In a second paper Blake (1886) continued the use of these same terms but elevated his subgenera to generic rank and assumed that the species he assigned to *Mutilla* were congeneric with the Old World species assigned to that genus. Ashmead (1899) proposed the new genus *Timulla* with *Mutilla dubitata* Smith as genotype. *Timulla* by definition included those species which Blake had included in his "Division I" of *Mutilla*. Fox (1899) apparently had his manuscript finished before the publication of Ashmead's paper and treated the same group of species as "group *hexagona*" of the genus *Mutilla*. André (1903) reduced *Timulla* to a synonym of *Mutilla* L. and restored all the species to that genus. Bradley (1916) used *Timulla* as a subgenus of *Mutilla* in his revision of the group.

The males of the New World species of *Timulla* (subgenus *Timulla*) not only differ from *Mutilla* L. in the form of the first abdominal segment but also differ in the form of the genitalia. The females of *Timulla* (*Timulla*) differ from those of *Mutilla* L. in the form of the first abdominal segment, and in the type of pattern of pale pubescent markings. *Timulla* is not at all closely related to *Mutilla* but has close affinities with the Old World species of *Trogaspidia*. I consider the genus *Timulla* as a valid genus with cosmopolitan distribution and use the subgenus *Timulla* to include all the New World species.

The present paper deals with all the known species occurring in North America north of Mexico. A future paper will treat all the Mexican, Central American, South American and West Indian species. All of the species treated herein have the scutellum non-gibbose, slightly and evenly convex in the males. All of the females have the head entirely ferruginous. A large percentage of the nearctic female *Timullas* have black heads and many of the nearctic males have the scutellum gibbose.

The morphological characters of the males which are most useful

in the diagnosis of the species occurring north of Mexico are as follows: form of the last abdominal tergite; a median, elongate, glabrous area is present on this tergite which terminates in various types of carinae, in tubercles, or is sloped off to the distal margin of the tergite; the distal margin of the last tergite may be emarginate medially as in *leona* or not; the sixth, seventh, and eighth sternites, as well as the hypopygium, may be armed with tubercles or ridges, and the presence or absence of these tubercles is important; the form of the scape is modified in many species; what may be considered normal is a more or less cylindrical, arcuate scape which is bicarinate beneath; a number of species, of which *vagans* is typical have the terminal portion of the scape dilated and flattened, with a single strong carina beneath and provided beneath at the tip with a thick brush of pale, glittering hairs; some species have the mandibles simple, not excised and without a strong tooth beneath, others have the mandibles deeply excised beneath and with a strong tooth near the base beneath; the form of the median area of the clypeus is diagnostic in many cases; one group of species represented by *sayi* Blake has this area subtriangular and almost flat, others such as *vagans* have the same area transversely concave and the posterior elevated margin of the area arcuate; in many species the posterior, inner angle of the middle coxae bears an acute tooth while others have the middle coxae unarmed; additional minor characters are the color of the wings, comparative lengths of first and second segments of the flagellum, form of the first segment of flagellum, sculpture of the propodeum, presence or absence of mesosternal tubercles, color of calcaria, color and distribution of pubescence, color of integument, and finally the size of the ocelli.

It is peculiar that certain male Mutillidae and Myrmosidae which are nocturnal and are attracted to lights all have enormous ocelli, although there is apparently no morphological evidence to indicate that the function of the ocelli is related to the amount of light available. Nevertheless, the mutillids belonging to the genus *Photopsis* (sens lat.), and the myrmosids of the genera *Brachycistis* and *Chyphotes* are all nocturnal, are attracted to lights, and all have enormous ocelli. Most of the species of *Timulla* are apparently diurnal and have small ocelli, but certain species such as *sayi*, *hollensis*, *subhyalina*, *ocellaria* and *huntleyensis* have very large ocelli and many specimens of these species are before me which bear labels "taken at light." Here is a group of species in which part are diurnal as far as we know and which have small ocelli, while another group which have large ocelli have been taken at lights at

night. What is the significance of this apparent correlation between large ocelli on the one hand, and nocturnal habits and positive phototropism on the other?

The genitalia of the males discussed herein have all been examined and studied. The genitalia *in toto*, *i.e.*, removed from the abdomen but not dissected apart do not offer any characters of specific value. The genitalia of each species was therefore dissected into its various parts and mounted on slides. A study of these slides has shown that while the genitalia exhibit subtle specific differences, the latter are by no means as useful in a diagnostic way as the external morphological differences of the body. I (1934) found in a study of the Mutillidae of the Philippine Islands that those species of *Timulla* (*Trogaspidia*) having a gibbose scutellum had decidedly asymmetrical genitalia, *i.e.*, the two halves of the uncus were unlike and were modified in such a way as to present obvious specific and even subspecific differences. On the other hand those Philippine species of the same genus which have a non-gibbose scutellum had the two halves of the uncus symmetrical or only very weakly asymmetrical. These latter species invariably have the fifth, sixth and seventh sternites as well as the hypopygium simple, without tubercles or ridges. Our American species of *Timulla* (*Timulla*) discussed herein have a non-gibbose scutellum, and have the two halves of the uncus weakly asymmetrical, but have well developed tubercles on one or more of the above mentioned sternites and ridges on the hypopygium.

The morphological characters of the females most useful for diagnosing species are as follows: relative widths of the thorax anteriorly and posteriorly, in *ferrugata* the thorax is wider posteriorly than anteriorly, in others the two widths are the same, while in *navasota* the thorax is narrower posteriorly than anteriorly; the sides of the dorsum of the thorax may be parallel and not emarginate, or they may be distinctly emarginate medially; sculpture of the pygidium; presence or absence of the scutellar scale; presence or absence of a mesonotal-scutellar suture; puncturation of the second abdominal tergite, pubescent pattern of the dorsum of the abdomen; color of pubescence at the distal margin of the first tergite, and the color of the terminal abdominal segments.

For some reason which is not readily apparent the males and females of the genus *Timulla* are taken more often in copula than the two sexes of any other group of Mutillidae. This fact together with an abundance of available material has enabled me to correlate the two sexes of the majority of the species. Bradley (1916) was

able to correlate the two sexes of four species; I have been able to correlate the two sexes of fourteen species and subspecies from the material before me. Our knowledge of host relationships is very deficient; nothing whatever is known about the hosts of any of the New World species. *Timulla (Trogaspidia) minor* subsp. *minor* Ashmead has been reared from *Tiphia lucida* Ashmead in the Philippine Islands, but not a single New World *Timulla* has ever been reared from its host so far as is known.

KEY TO THE SPECIES OF TIMULLA

Males

1. Distal margin of last abdominal tergite distinctly emarginate medially 2
 Distal margin of last abdominal tergite not emarginate medially 3
2. Median, impunctate area of last tergite terminating in a transverse, arcuate carina; tegulae sparsely, pale pubescent *leona* (Blake)
 Median, impunctate area of last tergite terminating in an inverted U-shaped carina, the sides of the U diverging, not parallel; tegulae thickly, pale pubescent *tyro* n. sp.
3. Wings conspicuously banded, that is, fuscous with a median, transverse, hyaline band 4
 Wings subhyaline to fuliginous but not transversely banded as above 5
4. Scape with a strong, sharp carina beneath, without a brush of hairs, but with sparse, white hairs beneath; first segment of flagellum compressed but not noticeably broader than the following segments; clypeus without a median tubercle near its anterior margin *ornatipennis* (Bradley)
 Scape not carinate, but with a very dense brush of long, white pubescence; first segment of flagellum very broad and flat, much broader than the following segments; clypeus with a median tubercle near its anterior margin *barbata* (Fox)
5. Last abdominal tergite with a low, median, longitudinal, impunctate ridge, not elevated posteriorly, but terminating in a pair of obscure, almost obsolete tubercles, and continued to the distal margin by a low, sharp, median carina *ferrugata* (Fabricius)
 Last abdominal tergite with a high, median, angulate keel posteriorly, or with a median, impunctate, glabrous ridge terminating in the arms of a Y-shaped carina 6

6. Last abdominal tergite with a high, median, keel posteriorly, the dorsal and caudal lines of which form a right angle 7
 Last abdominal tergite with a median, impunctate, glabrous ridge terminating in the arms of a Y-shaped carina 8
7. Calcaria pale; head, pronotum and anterior half of mesonotum clothed with pale pubescence.
navasota subsp. *navasota* (Bradley)
 Calcaria dark brown; head, pronotum and mesonotum clothed for the most part with black pubescence.
navasota subsp. **nebulosa** n. subsp.
8. Fifth and sixth abdominal sternites each with a pair of well developed lateral tubercles, while the seventh sternite and the hypopygium have oblique, low carinae 9
 Fifth sternite without lateral tubercles, and sometimes the sixth sternite without lateral tubercles 10
9. Pronotum, mesonotum, scutellum and sometimes propodeum more or less ferruginous.....*dubitata* subsp. *dubitata* (Smith)
 Thorax entirely black*dubitata* subsp. **fugitiva** n. subsp.
10. Mandibles distinctly excised beneath and with a conspicuous tooth beneath near the base 14
 Mandibles not excised beneath, although sometimes shallowly emarginate, never with a conspicuous tooth beneath near the base 11
11. Mesosternal tubercles well developed and oblique in position; sternites six and seven with strong, prominent lateral tubercles; median area of clypeus transversely concave, the posterior elevated margin arcuate 12
 Mesosternal tubercles absent; sixth sternite without lateral tubercles, the seventh with only rudimentary lateral tubercles; median area of clypeus triangular, flat, scarcely at all concave 26
12. First segment of flagellum and the proximal half of the second strongly compressed and broadened, the first segment distinctly longer than the second; scape without a pubescent brush beneath; propodeum very coarsely reticulate**compressicornis** n. sp.
 First and second segment of flagellum cylindrical, not compressed or broadened, the first slightly shorter than the second; scape with a thin brush of pale pubescence beneath; propodeum moderately reticulate 13
13. Pubescence of vertex, pronotum, mesonotum, tegulae and abdominal tergites, for the most part black; integument of

second abdominal tergite entirely ferruginous except the narrow, distal margin more or less black.

barbigera subsp. *barbigera* (Fox)

Pubescence of vertex, pronotum, mesonotum and tegulae glittering ferruginous for the most part; pubescence of abdominal tergites entirely fulvous; second abdominal tergite ferruginous except the proximal fourth black.

barbigera subsp. *rohweri* n. subsp.

14. Scape more or less broadened and flattened distally, with a single well-developed carina beneath, and with a more or less dense brush of pale pubescence beneath 15

Scape scarcely broadened and not flattened distally, with two distinct, parallel carinae beneath, and without a brush of pale pubescence beneath 20

15. Abdomen mostly ferruginous, clothed with sparse, black pubescence 16

Abdomen mostly fulvous, clothed with glittering, fulvous pubescence 17

16. Thorax entirely black *vagans* subsp. *vagans* (Fabricius)
At least the pronotum and mesonotum ferruginous.

vagans subsp. *rufinota* n. subsp.

17. Scape strongly dilated and flattened distally, the brush of pale hairs dense, conspicuous 18

Scape only moderately dilated distally, the brush of pale hairs sparse, inconspicuous 19

18. Ocelli large, the distance between the eye margins and the lateral ocelli equal to twice the diameter of the latter; pubescence of vertex and pronotum pale; oblique carina of hypopygium dentiform posteriorly; second abdominal sternite blackish *huntleyensi* n. sp.

Ocelli small, the distance between the eye margins and the lateral ocelli at least three times the greatest diameter of the latter; erect pubescence of vertex and pronotum black; oblique carina of hypopygium rounded, not dentiform posteriorly; second abdominal sternite entirely ferruginous.

grotei (Blake)

19. Second abdominal sternite infuscated to distinctly black; pale pubescence of pronotum sparse.

suspensa subsp. *sonora* n. subsp.

Second abdominal sternite entirely ferruginous; pale pubescence of pronotum thick.

suspensa subsp. *jonesi* n. subsp.

20. Ocelli small, the distance between the eye margins and the lateral ocelli equal to three or more times the greatest diameter of the latter 21
 Ocelli very large, conspicuous, the distance between the eye margins and the lateral ocelli slightly less than the greatest diameter of the latter 25
21. Thorax conspicuously, but not entirely, ferruginous; abdomen ferruginous, clothed with sparse, ferruginous pubescence or with black and pale pubescence 24
 Thorax entirely black; abdomen fulvous, clothed with sparse, fulvous pubescence 22
22. First abdominal segment black; wings fuliginous with a slightly darker band at the apex; intermediate coxae with a tubercle at the inner posterior margin *oajaca* (Blake)
 First abdominal segment ferruginous like the remainder of the abdomen; wings subhyaline with a darker band at the apex; intermediate coxae with a distinct tooth at the inner posterior margin 23
23. Middle and posterior tarsi ferruginous; sides of propodeum reticulate; median, glabrous area of clypeus depressed and concave medially *neobule* n. sp.
 Middle and posterior tarsi black; sides of propodeum with moderate, distinct, shallow punctures; median, glabrous area of clypeus transversely concave *nitela* n. sp.
24. Clypeus transverse, subrectangular, transversely concave; abdomen clothed with sparse, ferruginous pubescence.
floridensis (Blake)
 Median area of clypeus subtriangular, almost flat, only slightly concave; anterior abdominal tergites with black, apical fringes, the distal tergites with pale, glittering pubescence.
kansana n. sp.
25. Thorax entirely black *ocellaria* subsp. *ocellaria* n. subsp.
 Prothorax and mesonotum ferruginous, remainder of thorax black *ocellaria* subsp. *rufidorsa* n. subsp.
26. Ocelli small, the distance between the eye margins and the lateral ocelli at least twice the greatest diameter of the latter. 27
 Ocelli large, the distance between the eye margins and the lateral ocelli distinctly less than twice the greatest diameter of the latter 28
27. Propodeum very deeply and coarsely reticulate; legs clothed with pale pubescence; distance between the eye margins

- and lateral ocelli equal to three times the diameter of the latter *rufosignata* (Bradley)
- Propodeum only moderately reticulate; legs clothed with black pubescence; distance between the eye margins and lateral ocelli equal to slightly more than twice the greatest diameter of the latter *tolerata* n. sp.
28. Wings subhyaline; thorax almost entirely ferruginous, only the mesosternum black *subhyalina* n. sp.
- Wings fuscous to fuliginous; thorax either entirely black, or only the pronotum, propleura and mesonotum ferruginous. 29
29. Distance between the eye margins and lateral ocelli equal to approximately one and one-half times the greatest diameter of the latter; tegulae very dark ferruginous or black, not concolorous with the mesonotum if the latter is ferruginous. 30
- Distance between the eye margins and lateral ocelli approximately equal to the greatest diameter of the latter; tegulae ferruginous, concolorous with the mesonotum.....*sayi* (Blake)
30. Pronotum, propleura and mesonotum ferruginous. *hollensis* subsp. *hollensis* (Melander)
- Thorax entirely black *hollensis* subsp. *melanderi* n. subsp.

Females

1. Thorax very noticeably broader posteriorly than anteriorly 2
- Thorax only slightly or not at all broader posteriorly than anteriorly 3
2. Pygidial area obscurely sculptured, only faintly granulate. *floridensis* (Blake)
- Pygidial area longitudinally striate*ferrugata* (Fabricius)
3. Second abdominal tergite with coarse, confluent punctures, especially at the sides, the punctures conspicuous through the pubescence; distal half of pygidial area granulated 4
- Second abdominal tergite finely punctate throughout, without conspicuous, large punctures visible through the pubescence, or if with moderately large punctures, the latter well separated and interspersed with fine punctures; distal half of pygidial area either striate, rugose or granulate. 6
4. Scutellar scale well developed; anterior pale pubescent markings of second tergite linear *oajaca* (Blake)
- Scutellar scale absent; anterior pale pubescent markings of second tergite ovate 5

5. Thorax very slightly narrowed posteriorly the sides of the dorsum subparallel; abdomen largely ferruginous to dark ferruginous; legs entirely bright ferruginous.
navasota subsp. *navasota* (Bradley)
 Thorax strongly narrowed posteriorly, the sides of the dorsum distinctly converging posteriorly; abdomen mostly black; at least the tibiae and tarsi black.
navasota subsp. **nebulosa** n. subsp.
6. Sides of dorsum of thorax not emarginate medially 7
 Sides of dorsum of thorax distinctly emarginate medially 11
7. Pygidial area finely, longitudinally striate 8
 Pygidial area irregularly rugose, or granulate 9
8. Lateral margins of posterior face of propodeum strongly denticulate; legs, especially the tibiae, dark ferruginous; abdomen dusky to black above except the pale pubescent markings *leona* (Blake)
 Lateral margins of posterior face of propodeum slightly serrate, but not strongly denticulate; legs pale ferruginous throughout; abdomen ferruginous, except pale pubescent markings, only slightly dusky above **tyro** n. sp.
9. Disk of second tergite finely punctate, only the lateral areas of the tergite with large punctures; pygidial area irregularly rugose 10
 Disk of second tergite with moderately large, separated punctures interspersed with fine punctures; pygidial area granulate **nicholi** n. sp.
10. Abdomen reddish; anterior, lateral, pale pubescent spots on second tergite indistinct or entirely absent.
ornatipennis (Bradley)
 Abdomen black, with pale pubescent markings, the anterior, lateral, pale pubescent spots on the second tergite distinct.
wileyae n. sp.
11. Last three abdominal tergites bright ferruginous, clothed with ferruginous pubescence 12
 Last three abdominal tergites dusky or black, without ferruginous pubescence 13
12. Sides of thorax deeply emarginate medially; ferruginous area of second tergite with moderate, distinct, separated punctures; second tergite with a median, obscure spot of sparse, black pubescence at the anterior margin *euterpe* (Blake)
 Sides of thorax only shallowly emarginate medially; second

- tergite with intermixed small and fine punctures throughout; anterior margin of second tergite without a median, obscure, black pubescent spot **euphrosyne** n. sp.
13. Posterior margin of first abdominal tergite with a pale pubescent band 14
 Posterior margin of first abdominal tergite with a black pubescent band **dubitatiformis** n. sp.
14. Scutellar scale entirely absent 15
 Scutellar scale present and distinct 16
15. Sides of thorax weakly emarginate; front, vertex and dorsum of thorax with moderate, contiguous punctures; legs entirely black **contigua** n. sp.
 Sides of thorax strongly, deeply emarginate; front, vertex and dorsum of thorax with coarse, confluent punctures; coxae, trochanters and femora ferruginous.
barbigera subsp. *barbigera* (Bradley)
16. Second abdominal tergite with lateral, narrow, subparallel, pale pubescent bands connecting the posterior marginal, pubescent bands of the first and second tergites 17
 Second abdominal tergite without complete, longitudinal pubescent bands, at the most with lateral, elongate, pale pubescent spots on the anterior half 18
17. Legs entirely black *suspensa* subsp. *suspensa* (Gerstaecker)
 Legs, at least the coxae, trochanters and femora, ferruginous.
suspensa subsp. **sonora** n. subsp.
18. Mesonotal-scutellar suture distinct just anterior to the scutellar scale, the latter broad and distinct 19
 Mesonotal-scutellar suture not evident; scutellar scale narrow, not prominent; pygidial area longitudinally rugose.
dubitata subsp. *dubitata* (Smith)
19. Second abdominal tergite velvety black, without anterior, pale pubescent spots, with only a posterior marginal, pale pubescent band; fifth tergite with the pale pubescent spots distinctly separated *grotei* (Blake)
 Second abdominal tergite ferruginous to blackish, with a pair of more or less distinct, pale pubescent spots on the anterior half; fifth tergite with a pale pubescent band, narrowed medially but not interrupted 20
20. United States and Canada east of the Rocky Mountains except Florida *vagans* subsp. *vagans* (Fabricius)
 Florida *vagans* subsp. **rufinota** n. subsp.

Timulla (*Timulla*) *ferrugata* (Fabricius). (New combination)

1804. *Mutilla ferrugata* Fabricius, Syst. Piez., p. 438, no. 47, female.
1811. *Mutilla ferrugata* Olivier, Encycl. méthod. Insect., viii, p. 60, no. 34, female.
1845. *Mutilla ferrugata* Lepeletier, Hist. nat. Insect. Hymén., iii, p. 608, female.
1845. *Mutilla rufa* Lepeletier, Hist. nat. Insect. Hymén., iii, p. 631, male. (New synonymy.)
1871. *Mutilla Promethea* Blake, Trans. Amer. Ent. Soc., iii, p. 229, male. (New synonymy.)
1886. *Mutilla Promethea* Blake, Trans. Amer. Ent. Soc., xiii, p. 198, male.
1897. *Mutilla ferrugata* Dalla Torre, Cat. Hymen., viii, p. 40, female.
1897. *Mutilla Promethea* Dalla Torre, Cat. Hymen., viii, p. 74, male.
1897. *Mutilla rufa* Dalla Torre, Cat. Hymen., viii, p. 79, male.
1899. *Mutilla promethea* Fox, Trans. Amer. Ent. Soc., xxv, p. 271, male.
1903. *Mutilla promethea* André, Gen. Ins., i, fasc. 11, p. 42, male.
1903. *Mutilla rufa* André, Gen. Ins., i, fasc. 11, p. 42, male.
1903. *Ephuta ferrugata* André, Gen. Ins., i, fasc. 11, p. 60, female.
1903. *Mutilla promethea* Melander, Trans. Amer. Ent. Soc., xxix, p. 323, male.
1916. *Mutilla* (*Timulla*) *promethea* Bradley, Trans. Amer. Ent. Soc., xlii, p. 209, male and female.
1928. *Timulla ferrugata* Mickel, Bull. 143, U. S. Nat. Mus., p. 135, female.

Type.—Female, Carolina, in collection of University of Kiel. Holotype of *rufa* Lepeletier is in Spinola collection, University of Turin, Turin, Italy. Holotype of *promethea* Blake is in American Entomological Society collection, Philadelphia.

Specimens examined.

NEW JERSEY: male, Weymouth, July 23, 1923.

MARYLAND: female.

VIRGINIA: male, Norfolk, July 8, 1910 (F. A. Johnston); male, Norfolk, September 21 (E. G. Smyth).

NORTH CAROLINA: male, Wilmington, January 21, 1919 (Max Kisliuk); male, Raleigh, October, 1917 (J. E. Eckert); male, Southern Pines, September 24, 1907 (A. H. Manee); male, Lumberton, July 3, 1903 (F. Sherman).

SOUTH CAROLINA: female, Columbia, September 10, 1908; male, Myrtle Beach, July 5, 1927 (H. C. Coker).

GEORGIA: female, Savannah; male, Clyde, September 11–12, 1931 (Bradley and Knorr); female, Fort Valley, September 6, 1902 (Bridwell); male, Tifton, June 13, 1906; male, Tifton; female, Albany, May 16, 1916 (W. D. Pierce); male, Swainsboro, May 31, 1931 (P. W. Fattig); male, St. Simon's Island, June 4, 1911; female, St. Simon's Island, July 14, 1931 (C. A. Frost); three males, Billy's Island, Okefenokee Swamp, June, 1912; four females, Spring Creek, Decatur Co., May 18–21, 1916 (J. C. Bradley); female, Spring Creek, Decatur Co., June 7–23, 1911 (J. C. Bradley); eleven females, male, Spring Creek, Decatur Co., July 16, 29, 1912 (J. C. Bradley); female, Spring Creek, Decatur county, August 9–12, 1931 (Bradley and Knorr); male, Bainbridge, May 30–June 1, 1911 (J. C. Bradley); female, Bainbridge, July 30, 1912; male, Bainbridge; female, Thomasville, May 21, 1915 (C. S. Spooner); two males, four females.

FLORIDA: female, LaBelle, April 18 (J. N. Knull); female, Jacksonville, July 21; female, Jacksonville; female, Lakeland (G. G. Ainslie); female, Sanford, April, 1932 (C. O. Bare); female, Sanford, May 21, 1931 (C. O. Bare); male, Orlando, May 28, 1925 (O. C. McBride); male, Orlando, June 2, 1925 (O. C. McBride); male, Gainesville, Alachua county, April 23, 1922; two males Gainesville, Alachua county, May 4, 1928 (Alexander-Walker); female, Gainesville, Alachua county, May 11, 1911; female, Gainesville, August 17, 1931 (Bradley and Knorr); female, Alachua county, March 18, 1930 (C. J. Guard); female, Palatka, May 3–4, 1916 (J. C. Bradley); male, Lake County, April 20, 1922 (T. P. Winter); two males, Kissimmee Prairie, August 25, 1931 (Bradley and Knorr); female, Homestead, March 5 (A. Mosier); male, Homestead, April 18, 1924 (T. R. Robinson); female, Indian River (H. G. Hubbard); female, Ft. Mead, August 13, 1930 (R. H. Beamer); female, Wildwood, August 2, 1930 (J. Nottingham); female, Enterprise, April 18; female, Bell Glade, July, 1926 (M. D. Leonard); three males.

MISSISSIPPI: female, Agricultural College, April 16, 1916 (W. H. Carpenter); female, Agricultural College, November 1, 1917 (N. A. Moore); female, Agricultural College, June 15, 1915 (C. C. Greer); male, Agricultural College, June 27, 1914 (C. C. Greer); male, Agricultural College, July 3, 1914 (C. C. Greer); male, Agricultural Col-

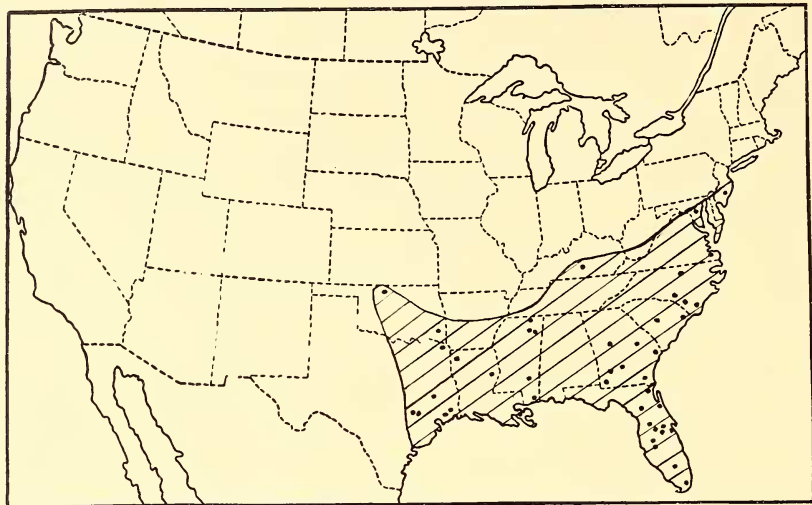
lege, July 6, 1914 (C. C. Greer); male and female, Agricultural College, July 10, 1914 (C. C. Greer); two males, Agricultural College, July 14, 1914 (C. C. Greer); female, Agricultural College, May 8, 1921 (P. D. Sanders); male, Agricultural College, June 25, 1913 (J. G. Hester); two females, Agricultural College, July 1, 1913 (J. G. Hester); male, Agricultural College, July 14, 1913 (J. G. Hester); male, Agricultural College, July 19, 1913 (J. G. Hester); female, Agricultural College, fall, 1921 (G. A. Thompson); two females, Agricultural College, July 10, 1913 (T. F. McGehee); female, Agricultural College, July 29, 1913 (T. F. McGehee); female, Agricultural College, May, 1922 (C. T. Wallace); female, Agricultural College, May 14, 1921 (S. W. Box); female, Agricultural College, October 14, 1914 (S. M. Thomas); female, Agricultural College, October 20, 1914 (A. M. Rogers); female, Agricultural College, May 1, 1922 (W. C. Avens); female, Agricultural College, May 16, 1921 (C. E. Loeb); female, Agricultural College, April 15, 1922 (H. C. Ashcraft); female, Agricultural College, June 13, 1921 (J. W. Lumpkin); male, Agricultural College, July 12, 1921 (J. W. Lumpkin); female, Agricultural College, April 24, 1921 (R. D. Morrow); female, Agricultural College, March 30 (J. C. Garrett); female, Agricultural College, November 5, 1921 (C. E. Ross); male, Agricultural College, October, 1919 (W. M. Porter); male, Agricultural College, August 6, 1913 (C. F. Stiles); male, Agricultural College, May, 1922 (J. H. Heckman); male, Agricultural College (P. D. Houston); female, Agricultural College, July 25, 1917; female, Starkville, May 14, 1922 (O. E. Earnest); male, Blue Mountain, July 11, 1914 (H. H. Carter); male, Laurel, August, 1916 (M. G. Dyess); two males, Ocean Springs, June 5, 1915 (F. F. Bibby); two males, Ocean Springs, June 8, 1915 (F. F. Bibby); male, Ocean Springs, June, 1915 (F. F. Bibby).

KENTUCKY: male.

LOUISIANA: male and female (in copula) Tallulah, October 16, 1910 (R. A. Cushman); female, Tallulah, April 10 (R. A. Cushman); male, Tallulah, June, 1916 (C. S. Whittington); female, Shreveport, May 29, 1905; male, New Orleans; female, Lake Bruins, August 3, 1925 (B. E. Montgomery); eight males, two females.

TEXAS: female, Wharton, June 24, 1917; female, Willis, May 14, 1903 (Bridwell); female, Columbus (Wickham); two females, Colorado county, August 5, 1922 (Grace O. Wiley); female, Liberty, October 12, 1933; female, Madison county, August 20, 1931 (F. F. Bibby); male, Nome, June 21, 1918 (E. L. Diven); male, New Boston, October 26, 1906 (F. C. Bishopp); male.

OKLAHOMA: female, Latimer county, June 16, 1931 (R. D. Bird); female, Isabel, June 8, 1931 (C. C. Deonier); male and female (in copula), Alfalfa county, August 6, 1932 (Pritchard and Deonier).



Distribution of *Timulla* (*Timulla*) *ferrugata* (Fabricius)

I have previously (1928) suggested that *ferrugata* Fabricius belonged to the genus *Timulla*. Through the courtesy of Dr. Olav Schroeder, of the Zoological Institut, University of Kiel, and Dr. H. Bischoff, of the Zoological Museum of the University of Berlin, I was able to reexamine a specimen in the Kiel collection bearing a label "*ferrugata*" in Fabricius' handwriting. This specimen agrees exactly with the original description. The latter particularly describes the distal margin of the first abdominal segment as black, and the remaining margins cinereus. The Kiel specimen has the distal margin of the first segment black and the margins of the remaining segments cinereus, but the first segment has obviously been rubbed and was originally clothed with pale pubescence. Other diagnostic characters of the Kiel specimen are the thorax broader behind than in front, and the legs black except ferruginous femora. Females which Bradley (1916) assigned to *promethea* Blake agree in every respect with the Kiel specimen, including the black distal margin of the first tergite although the black area of Bradley's specimens is clothed with pale pubescence.

The original description of *ferrugata* mentions the specimens as belonging to the Bose collection. This collection is now in the

Muséum Nationale d'Histoire Naturelle, Paris. I have investigated the possibility of the type's presence there. There is only one specimen in the Bosc material at Paris that can possibly have any claim as the type specimen of this species. It is labeled "*M. antiquensis* Fabricius. H. in Carolina." It is a specimen of *Dasymutilla lepeletierii* Fox. It cannot be the type for the following reasons: (1) The description states "parva"; this specimen is large, 14 mm. long; (2) Description states "reliquis margine cinereo"; this specimen has the distal margin of the second tergite black with a median, pale pubescent spot; (3) Description states "femoribus ferrugineis"; the specimen has the femora blackish like the other parts of the leg.

Further confirmatory evidence that the Kiel specimen is the one Fabricius described as *ferrugata* is to be found in the fact that specimens in the Spinola collection at Turin, Italy, which originally came from the Olivier collection and the Latreille collection are labeled "*ferrugata* Fabr." and are conspecific with the Kiel specimen.

I have examined the female recorded by Bradley (1916) as the allotype of *promethea* Blake and find it to be the same as the Kiel specimen. A second pair taken in copula is recorded above from Louisiana and a third pair from Oklahoma. The male in both cases is the same as *rufa* Lepeletier and *promethea* Blake. I have examined the holotype of both *rufa* and *promethea* and find them to be identical. The female in both of the above cases is the same as the Kiel specimen.

Timulla (*Timulla*) *ornatipennis* (Bradley). (New combination)

1916. *Mutilla* (*Timulla*) *ornatipennis* Bradley. Trans. Amer. Ent. Soc., xlii, pp. 205-206, 318, male and female.

Holotype male and allotype female.—Southern Pines, North Carolina, August 12, 1907 (A. H. Manee), nos. 111.1 and 111.2 in Cornell University collection, Ithaca, New York.

Diagnostic characters of the female not mentioned in the original description are: scape and pedicel ferruginous, the flagellum blackish; antennal scrobes distinctly carinate above; sides of dorsum of thorax parallel, not noticeably emarginate at the mesonotal region; length of thorax about one and two-thirds times the width; dorsum of thorax with large, confluent punctures, almost longitudinally rugoso-punctate; mesonotal-scutellar suture obsolete; scutellar scale present and distinct; lateral margins of posterior face of propodeum denticulate; second tergite finely punctate on the disk, the punctures becom-

ing moderate in size towards the sides; anterior pale pubescent spots of second tergite obsolete; pygidial area irregularly rugose; median carina of first sternite elevated anteriorly into a prominent tooth.

The holotype and allotype have been examined and specimens compared with them.

Specimens examined.—

NEW JERSEY: two females, Iona, May 16, 1909 (G. M. Greene).

VIRGINIA: two males, Falls Church, September 4, 1915 (C. T. Greene); female, Falls Church, September 14, 1915 (G. M. Greene); female, Colonial Beach, July, 1897; female, Clifton, July 15, 1923 (J. C. Bridwell); two females, Clifton, July, 1933 (J. C. Bridwell); two females, Clifton, August 20, 1933 (J. C. Bridwell).

NORTH CAROLINA: male and female (in copula), Southern Pines, July 9, 1907 (A. H. Manee); female, Raleigh, April 16, 1904 (C. S. Brimley); female, Raleigh, early August (C. L. Metcalf); female, Kittrell, September, 1917 (J. E. Eckert); male, Wilson, September 1, 1914; female (Forel).

SOUTH CAROLINA: female, Clemson College (J. O. Pepper).

GEORGIA: female, Atlanta, April 23, 1933 (P. W. Fattig); female, Atlanta, August 11, 1934 (P. W. Fattig); female, Atlanta, August 30, 1934 (P. W. Fattig); female, Atlanta, September 5, 1932 (P. W. Fattig); male and female (in copula), Stone Mt., August 11, 1932 (P. W. Fattig); female, Chickamauga, July 10, 1898; male, Tifton; female, Billy's Island, Okefenokee Swamp, September 1-5, 1913.

FLORIDA: female, Tampa, March 27; male, Capron, April 25; female, Ft. Meyers, May 7, 1916 (J. C. Bradley); female.

ALABAMA: female, Greenville, August 3, 1915.

TENNESSEE: female, Knoxville, May 1, 1890; male.

MISSISSIPPI: female, Agricultural College, April 14, 1918 (C. M. Brickell); female, Agricultural College, April 6, 1919 (W. T. Covington); female, Lucedale, March 3, 1932 (H. Dietrich); female, Fulton, July 14, 1930 (P. W. Oman).

The characters used in the keys will separate both sexes of this species from related forms without difficulty. The female has been confused with *dubitata* Smith but that species has the thorax distinctly emarginate medially at the sides.

Timulla (Timulla) barbata (Fox). (New combination)

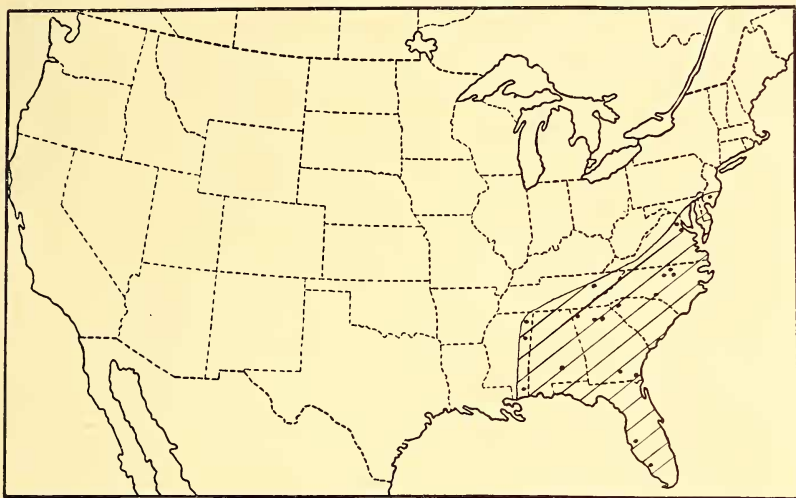
1899. *Mutilla barbata* Fox, Trans. Amer. Ent. Soc., xxv. p. 272, male.

1903. *Mutilla barbata* André, Gen. Ins., i, fasc. 11, p. 41, male.

1916. *Mutilla (Timulla) barbata* Bradley, Trans. Amer. Ent. Soc., xlii, p. 205, male.

Type.—Male, Ripley County, Missouri (P. J. Smith), in collection of American Entomological Society, Philadelphia.

A second specimen is in the collection of the University of Kansas; male, Caddo County, Louisiana, August 19 (R. H. Beamer).



Distribution of *Timulla (Timulla) ornatipennis* (Bradley)

The thick, long fringe of white hairs on the yellowish scape beneath; the broad, flat, first flagellar segment; and the banded wings separate this at once from all other species in the genus.

Timulla (Timulla) leona (Blake). (New combination)

1871. *Mutilla leona* Blake, Trans. Amer. Ent. Soc., iii, p. 230, female.

1886. *Mutilla leona* Blake, Trans. Amer. Ent. Soc., xiii, p. 200, female.

1894. *Mutilla leona* Cameron, Biol. Centr.-Amer., ii, p. 269, female.

1897. *Mutilla leona* Dalla Torre, Cat. Hymen., viii, p. 53, female.

1900. *Mutilla leona* Fox, Ent. News, xi, p. 401, female.

1903. *Mutilla leona* André, Gen. Ins., i, fasc. 11, p. 42, female.

?1903. *Mutilla nestor* Melander, Trans. Amer. Ent. Soc., xix, p. 323, male.

Type.—Female, Mexico (F. Sumichrast), in collection of American Entomological Society, Philadelphia.

The description of the male is as follows: Head, thorax and legs, black; first abdominal segment blackish, the posterior margin ferruginous; remainder of abdomen ferruginous; inferior margin of mandibles strongly emarginate and with a prominent tooth near the base; distal margin of last abdominal tergite distinctly emarginate medially. Length, 15 mm.

Head entirely black, clothed throughout with pale, glittering pubescence, thickest on the front; clypeus transversely concave, the concave area glabrous, and the elevated posterior margin of the glabrous area evenly arcuate; scape distinctly bicarinate beneath; first and second flagellar segments approximately equal in length; ocelli small, the distance between the lateral ones and the inner eye margins more than three times the greatest diameter of the former.

Thorax entirely black; pronotum clothed with erect and appressed, pale, glittering pubescence; mesonotum clothed with black pubescence, except the anterior fourth with pale, glittering pubescence; anterior half of scutellum with erect, black hairs, the posterior half with erect, pale hairs; propodeum clothed with sparse, appressed, pale pubescence; pleural areas clothed with sparse, pale pubescence; scutellum strongly, evenly convex, densely punctured; enclosed area of propodeum not elevated posteriorly into a tubercle; tegulae large, glabrous, finely punctate throughout, clothed throughout with sparse, pale, glittering pubescence; mesosternal tubercles transverse.

Abdomen ferruginous, except the first segment largely black, only the distal margin ferruginous, clothed throughout with erect and appressed, fulvous pubescence, except the erect pubescence of the first tergite pale; distal margin of last tergite distinctly emarginate medially; last tergite with a median, elongate, glabrous, impunctate area terminating before the distal margin in a transverse, strongly elevated carina, the latter viewed posteriorly distinctly arcuate; sixth sternite unarmed; seventh sternite with small lateral tubercles; hypopygium with a pair of widely separated, longitudinal ridges on the anterior half.

Legs entirely black, sparsely clothed with pale, glittering pubescence; middle coxae with a weak tooth at the inner, posterior margin; calcaria pale.

Wings dark fuscous.

Allotype.—Male, Tallulah, Louisiana, July 17, 1925, in collection of University of Minnesota.

Specimens examined.—

GEORGIA: two males, Bainbridge.

ALABAMA: male, Thomasville, June 10, 1917; three males, Jackson, Tombigbee River, June 10, 1917.

MISSISSIPPI: female, Agricultural College, June 24, 1914 (C. C. Greer).

ARKANSAS: male, Pine Bluff, September, 1890.

LOUISIANA: two females, New Orleans; male, Cameron, June 29, 1905; male, Tallulah, July 24, 1925; two males.

TEXAS: female, Brownsville, May 1, 1904 (H. S. Barber); three males, Galveston, May (F. H. Snow); male, Galveston, June 16, 1924 (Trotter); male, Galveston, July 24, 1924 (Trotter); three females, Richmond, May 29, 1918 (J. C. Bradley); two females, Richmond, Brazos River, June 22, 1917; eight females, five males, Wharton, June 24, 1917; male, Austin, May 21, 1921 (R. H. Painter); three females, Columbus (Wickham); female, Bastrop County; male, College Station, June 15, 1932; male, College Station, June 26, 1932 (H. J. Reinhard); male, College Station, August 17, 1932 (S. W. Bromley); two males, McLennan County, July 10, 1934 (F. F. Bibby); male and female, McLennan County, July 16, 1933 (F. F. Bibby); two females, Aransas County, August 6, 1928 (R. H. Beamer and A. M. James).

OKLAHOMA: male, Alfalfa County, August 6, 1932 (C. C. Deonier).

KANSAS: male, Douglas County, July 25, 1919 (Wm. E. Hoffmann); male, Riley County, June 30; male, Riley County, July 17 (Popenoe); female, Riley County, July 26 (G. A. Dean); female, Riley County, July 21 (Popenoe); female, Riley County, July 22 (G. A. Dean); female, Riley County, August 8 (J. B. Norton); female, Clay County, August, 1901 (Bridwell); male.

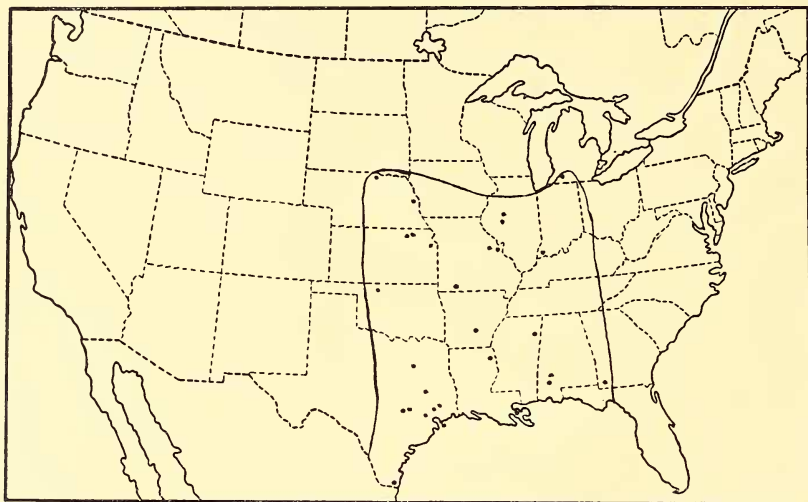
NEBRASKA: male, Omaha, July 7, 1914 (L. T. Williams); two males, Omaha, August 3, 1914 (L. T. Williams); male and female, Omaha, August 12, 1913 (L. T. Williams); female, Omaha, August 13, 1914 (L. T. Williams); male, Omaha, August 14, 1913 (L. T. Williams); male, Omaha, August 19, 1913 (L. T. Williams); female, Omaha, September 9, 1913 (L. T. Williams); male, Carns, July 22, 1902 (M. H. Swenk).

MISSOURI: male and female, Callaway County, October, 1898; male, St. Louis, August 16, 1922 (P. Rau); two females, St. Louis (P. Rau); male, Hollister, August 12, 1912 (H. H. Knight).

ILLINOIS: two females, Meredosia, August 22, 1898 (F. M. McE.); two females, Havana, October 6.

INDIANA: male and female, Posey County, August 10, 1927 (B. E. Montgomery).

MICHIGAN: male.



Distribution of *Timulla (Timulla) leona* (Blake)

The female of *leona* is closely related to *prominens* Cameron. The latter has the same form of thorax, the same sculpture of the pygidium and the same pubescent markings of the abdomen, but has an entirely black head. André (1898, Ann. soc. ent. France, lxxvii, p. 38) identified a male mutillid from Mexico as *ardens* Gerstaecker and described the female taken with it as the female of *ardens*. I have examined these two specimens in the Muséum Nationale d'Histoire Naturelle, Paris, and find that the male is not *ardens*, but an undescribed species, while the female is *prominens* Cameron. The male taken with this female must then be the male of *prominens*. This male has the distal margin of the last abdominal tergite emarginate medially, and has the median, impunctate, glabrous area of the same tergite terminating in a transverse carina before the distal margin of the tergite. The carina is slightly arcuate and extends transversely through the median three-fifths of the tergite. Since the female of *leona* is closely related to the female of *prominens*, it follows that the male of *leona* is probably related to the male of *prominens*. The male described above is not only closely related to

the male of *prominens* but it has practically the same geographical distribution as the females of *leona*. It differs from *prominens* in having sparser pale pubescence on the dorsum of the propodeum and on the tegulae, and the carina of the last abdominal tergite extends transversely through only the median two-fifths of the tergite, and is strongly arcuate. To further support this conclusion, the material before me includes five instances where this male and female have been collected at the same time and place, *i.e.*, McLennan County, Texas, July 16, 1933 (F. F. Bibby); Wharton, Texas, June 24, 1917; Callaway County, Missouri, October, 1898; Omaha, Nebraska, August 12, 1913 (L. T. Williams), and Posey County, Indiana, August 10, 1927 (B. E. Montgomery). The female has been confused in collections with *vagans* subsp. *vagans*, although the longitudinally striate pygidium separates it at once from that species. The male has been confused with *oajaca* which it resembles in color, but differs in the emarginate distal margin of the last abdominal tergite.

Timulla (Timulla) tyro n. sp.

Male.—Head and thorax black, clothed with pale pubescence, except the posterior three-fourths of the mesonotum with black pubescence; abdomen ferruginous, clothed with fulvous pubescence; legs black except the tibiae dark ferruginous and the tarsi distinctly ferruginous; tegulae with thick, pale pubescence; distal margin of last abdominal tergite emarginate; median, impunctate area of last tergite terminating in an inverted U-shaped carina. Length, 11 mm.

Head entirely black, clothed throughout with rather thick, erect and appressed, pale pubescence; mandibles strongly emarginate beneath and with a prominent tooth near the base beneath; clypeus transversely concave, the concave area glabrous, impunctate, the elevated, posterior margin evenly arcuate; scape distinctly bicarinate beneath; first and second segments of flagellum approximately equal in length; ocelli small, the distance between the eye margins and lateral ocelli equal to four times the diameter of the latter.

Thorax entirely black, clothed with pale pubescence, except the posterior three-fourths of mesonotum with black pubescence; pale pubescence thick on pronotum, scutellum and mesopleurae, elsewhere sparse; scutellum evenly convex, densely punctured; enclosed area of propodeum not elevated posteriorly into a tubercle; dorsum and posterior face of propodeum dis-

tinently, shallowly reticulate; tegulae large, clothed with thick, pale pubescence; mesosternal tubercles transverse.

Abdomen entirely ferruginous, clothed with fulvous pubescence throughout; distal margin of last tergite distinctly, roundly emarginate medially; last tergite with a narrow, elongate, median, impunctate area terminating in an inverted U-shaped carina, the sides of the U diverging posteriorly, not parallel; sixth sternite with a pair of distinct tubercles, one at each postero-lateral angle; seventh tergite with a pair of similar but slightly stronger tubercles; hypopygium with a pair of widely separated, longitudinal ridges anteriorly, the ridges elevated posteriorly forming a sharp tooth projecting backwards.

Legs black, except the tibiae dark ferruginous, and the tarsi distinctly ferruginous, clothed with sparse, pale pubescence; calcaria pale.

Wings fuscous.

Female.—Pale ferruginous throughout, including the legs; head and dorsum of thorax coarsely punctured, almost longitudinally rugoso-punctate; sides of dorsum of thorax parallel, not noticeably emarginate; scutellar scale broad and well developed; a distinct mesonotal-scutellar suture anterior to the scutellar scale; lateral margins of posterior face of propodeum slightly serrate, not strongly denticulate as in *leona*; abdomen finely punctured, slightly dusky above due to sparse, short, black pubescence; abdomen with pale markings above as in *leona*; pygidial area distinctly, longitudinally striate.

Holotype.—Male, Cat. No. 50954 U. S. National Museum, Imperial County, California, May, 1911 (J. C. Bridwell).

Allotype.—Female, Arizona, in collection of United States National Museum.

Paratype.—Female, Needles, California (Wickham), in University of Minnesota collection.

Closely related to *leona* Blake. The male differs from the latter as expressed in the key, in the ferruginous color of the tibiae and tarsi, the distinct tubercles on the sixth sternite and the thicker, pale pubescence on the head and pronotum. The female differs in the serrate, rather than strongly denticulate, lateral margins of the propodeum, and the much paler ferruginous color of the body and legs. Although the two sexes have not been taken in copulation there can be no doubt that the specimens placed here represent the two sexes of a single species. The female is so closely related to *leona* Blake that it is separated from specimens of that species with difficulty,

and while the male is distinct from the male of *leona* as noted above and in the key, it is very closely related. The geographical ranges of the two are widely separated in the United States, *leona* having been taken only as far west as central Texas while *tyro* is known from Arizona and southeastern California. *Tyro* will undoubtedly be found in the state of Sonora, Mexico, and possibly in lower California.

Timulla (*Timulla*) *navasota* subsp. *navasota* (Bradley). (New combination)

1916. *Mutilla* (*Timulla*) *navasota* Bradley, Trans. Amer. Ent. Soc., xlii, p. 213, male.

Holotype.—Male, Brazos County, Texas, in Museum of Comparative Zoology, Cambridge, Massachusetts.

The description of the female, which was heretofore unknown, is as follows: Female.—Head, thorax and legs ferruginous, except tips of mandibles and flagellum beyond the first segment blackish; abdomen ferruginous; second abdominal tergite with a pair of anterior, ovate, pale pubescent spots; lateral margins of thorax not emarginate medially; thorax slightly narrower posteriorly than anteriorly; scutellar scale absent; second tergite with large, close, confluent punctures throughout; pygidial area mostly granulate. Length, 9 mm.

Head entirely ferruginous, except the tips of the mandibles and the flagellum beyond the second segment blackish; mandibles edentate at the tip and with a small tooth within near the tip; clypeus elevated posteriorly, the elevated margin arcuate, and with a large, transverse, median tubercle immediately posterior to the elevated margin; scape obscurely punctate above; first segment of flagellum slightly shorter than the second and third segments united; antennal scrobes distinctly carinate above; front, vertex and genae with large, dense, confluent punctures throughout and clothed with sparse, erect pubescence, ferruginous on the front and vertex, pale on the genae; relative widths of head and thorax, 3.5:3.3.

Thorax entirely ferruginous, the dorsum clothed with sparse, erect, ferruginous pubescence, the posterior face of propodeum with sparse, erect, pale pubescence and the pleural areas with sparse, pale micropubescence; lateral margins of dorsum of thorax almost parallel, not emarginate medially, the thorax slightly but distinctly narrower posteriorly than anteriorly; relative widths of thorax at humeral angles and propodeum, 3.3:3.1; humeral angles rounded; dorsum of thorax

with large, dense, deep, confluent punctures, becoming shallower posteriorly and finally reticulate and slightly asperate on the posterior face of propodeum; scutellar scale entirely absent; lateral margins of posterior face of propodeum dentate; propleura densely punctuate anteriorly, the sides of propodeum with scattered, moderate punctures anteriorly and dense, large punctures posteriorly, and the pleural areas entirely micropunctate.

Abdomen ferruginous, dusky posteriorly; first tergite with moderately large, separated punctures and sparse, erect, pale pubescence, except the distal margin with a band of dense, appressed, pale pubescence; second tergite with large, close, more or less confluent punctures interspersed with fine punctures, clothed with sparse, erect and appressed, fuscous pubescence, except at the sides with sparse, erect, pale pubescence, and a pair of anterior, ovate spots and a broad, distal band of dense, appressed, pale pubescence, the anterior margin of the distal pubescent band slightly and angularly dilated medially; tergites three to five with moderate punctures anteriorly replaced by fine punctures posteriorly, clothed with sparse, erect and appressed black pubescence, except sparse, pale, erect pubescence at the lateral margins and each with a pair of subquadrate spots of dense, appressed, pale pubescence, the spots converging towards the tip of the abdomen, those on tergite five distinctly separated; pygidial tergite with pale and fuscous pubescence, the pygidial area granulate; first sternite with a median, longitudinal carina on the anterior two-thirds, the elevated margin of the carina distinctly emarginate anteriorly; second sternite with large, close punctures throughout, clothed with sparse, erect, pale pubescence and with a thin, distal fringe of pale hairs; tergites three to five with small, dense punctures towards the distal margin and each with a thin, distal fringe of pale hairs.

Legs entirely ferruginous, sparsely clothed with pale pubescence; calcaria pale.

Allotype.—Female, without locality data, taken in copula with a male, in collection of the United States National Museum.

Specimens examined.—

TEXAS: male, Lee County, September 7, 1905; male and female, Dallas (Boll); male, McLennan County, August 7, 1933 (H. B. Mills); male, Laredo, July 1, 1930 (H. M. Smith); male, Plano, July (E. S. Tucker); male, Plano, August (E. S. Tucker); two males,

Brownsville, June 5, 1904 (H. S. Barber); two males, Brownsville, June 6, 1904 (H. S. Barber); three males, Brownsville, June; male and female.

The female resembles the female of *oajaca* in having the second abdominal tergite strongly punctured, but differs from *oajaca* in having the thorax slightly narrower posteriorly than anteriorly, in the absence of the scutellar scale, in having the anterior, pale pubescent markings of the second tergite ovate instead of linear, and in the much more densely and deeply punctured anterior portion of the dorsum of the thorax. The allotype specimen has the abdomen rubbed so that the pale markings are practically obliterated; the description of the pale markings of the abdomen has been taken from one of the paratypes. The two females other than the allotype have the abdomen very dark ferruginous.

The male is closely related to *amulae* Cameron from Mexico, but the latter has much smaller ocelli and denser pale pubescence on the pronotum. This subspecies is replaced in western Texas, New Mexico and Arizona, as well as northwestern Mexico, by the following subspecies. Specimens vary in length from 13 to 22 mm.

Timulla (Timulla) navasota subsp. **nebulosa** n. subsp.

Male.—Exactly like subsp. *navasota* except the calcaria are very dark brown, and the pubescence of the head, pronotum and anterior half of mesonotum is predominantly black with a few pale hairs intermixed; mandibles not emarginate, not toothed beneath; ocelli large, the distance between the inner eye margins and the lateral ocelli equal to the greatest diameter of the latter. Length, 17 mm.

Female.—Head, thorax, coxae, trochanters and femora except the tips, ferruginous; flagellum, abdomen, tips of femora, tibiae and tarsi, black; lateral margins of thorax converging posteriorly, not emarginate medially, the thorax distinctly narrower posteriorly than anteriorly; narrow distal margin of first tergite, broad distal margin of second tergite, a pair of anterior spots on the second tergite, and a pair of large, quadrate, lateral spots on tergites three to five, all of dense, appressed, pale, glittering pubescence; second tergite coarsely punctate; pygidial area finely ridged in a pattern resembling a finger print. Length, 11 mm.

Head, scape, pedicel and proximal third of first flagellar segment, ferruginous, the remainder of the flagellum black; front and vertex clothed with sparse, glittering, very pale fer-

ruginous pubescence, the genae with sparse, pale, glittering pubescence; mandibles slender, edentate at the apex, not emarginate nor toothed beneath; clypeus elevated posteriorly into a prominent arcuate ridge, the latter with prominent lateral angles; first segment of flagellum slightly shorter than segments two and three united; antennal scrobes distinctly carinate above; front, vertex and genae strongly, confluent punctate, somewhat longitudinally rugoso-punctate; posterior margin of genae obscurely carinate; relative widths of head and thorax, 4.7:5.0.

Thorax entirely ferruginous, the dorsum clothed with sparse, erect and recumbent, glittering, very pale ferruginous pubescence; dorsum strongly, confluent, longitudinally rugoso-punctate; humeral angles moderately angulate; relative widths of thorax anteriorly and posteriorly, 5.0:4.2; scutellar scale entirely absent; posterior half of lateral margins of posterior face of propodeum dentate; lateral margins of dorsum of propodeum straight, not crenulate, gradually converging posteriorly from the pronotal tubercles; anterior margin of propleura defined by a carina; propleura with large, close punctures anteriorly and micropunctate throughout; mesopleura with moderate, close punctures at the posterior margin and on the postero-ventral area, as well as micropunctate throughout; metapleura with scattered, moderate punctures ventrally and micropunctate throughout; sides of propodeum with scattered, moderate punctures anteriorly and large, close punctures posteriorly, as well as micropunctate throughout.

Abdomen entirely black, clothed with sparse, erect and appressed, black pubescence except narrow, distal margin of first tergite, a pair of large, subovate spots on anterior half of second tergite reaching the anterior margin of tergite and merging into lateral pale areas, broad, distal margin of second tergite, lateral fifths of second tergite, a pair of large, transverse spots on tergites three to five, those on three widely separated, those on five distinctly separated but close, lateral areas of pygidial tergite, sparse pubescence on sternite two, and distal fringes of sternites two to five, all pale and glittering, the pubescence of the margins of tergites one and two, and spots on tergites two to five all dense and appressed; second tergite with large, close, dense, confluent punctures interspersed with very small punctures; pygidial area as described above; first sternite with a prominent thin keel elevated anteriorly and posteriorly; second

sternite with large punctures, dense and confluent laterally, close and only slightly confluent medially; sternites three to five with moderate, dense, confluent punctures distally.

Coxae, trochanters, femora except the tips, and front tibiae, ferruginous; tips of femora, intermediate and posterior tibiae, and all the tarsi, black; calcaria ferruginous.

Holotype.—Male, Douglas, Arizona, September, 1930 (W. W. Jones), in University of Minnesota collection.

Allotype.—Female, Santa Rita Mts., Arizona, August 12, 1932 (D. K. Duncan), in University of Minnesota collection.

Paratypes.—Male, Douglas, Arizona, September, 1930 (W. W. Jones); three males, Douglas, Arizona, August (F. H. Snow); male, Tucson, Arizona (F. H. Snow); two females, Tucson, Arizona (F. H. Snow); female, Palmerlee, Arizona, July 18 (H. A. Kaeber); male, Vegas José, New Mexico, August 4; male, Steins, New Mexico, July 14, 1917; three males, Phantom Lake, Fort Davis Quad, Davis Mts., Texas, June 14, June 19 and July 12, 1916 (F. M. Gaige); two females, Phantom Lake, Ft. Davis Quad, Davis Mts., Texas, May 24 and June 14, 1916 (F. M. Gaige); male, State of Coahuila, Mexico (C. A. Purpus).

The male paratype from Tucson, Arizona, has the calcaria brown, but the pubescence on the vertex, pronotum and anterior half of mesonotum is mostly pale. While the male and female have not been taken in copula, the relationships of the two sexes to the respective sexes of subsp. *navasota* make certain they are the two sexes of a single subspecies. The female of subsp. *nebulosa* is like that of subsp. *navasota* in the form of the thorax, absence of scutellar scale, sculpture of pygidium, puncturation of second abdominal tergite and pale markings of the abdomen. *Nebulosa* differs from *navasota* in having the thorax more strongly narrowed posteriorly and in the much darker color of the abdomen, tibiae and tarsi.

Timulla (Timulla) dubitata subsp. *dubitata* (Smith). (New combination)

1855. *Mutilla dubitata* Smith, Cat. Hymen. Brit. Mus. iii, p. 60, female.

1871. *Mutilla dubitata* Blake, Trans. Amer. Ent. Soc., iii, p. 256, female (in part).

1886. *Mutilla dubitata* Blake, Trans. Amer. Ent. Soc., xiii, p. 201, female (in part).

1897. *Mutilla dubitata* Dalla Torre, Cat. Hymen., viii, p. 33, female.

1899. *Mutilla dubitata* Fox, Trans. Amer. Ent. Soc., xxv, p. 270, female (in part).
 1899. *Timulla hexagona* Ashmead, John B. Smith's Insects of New Jersey, p. 535, female (in part).
 1903. *Mutilla dubitata* André, Gen. Ins., i, fasc. 11, p. 42, female.
 1903. *Mutilla dubitata* Melander, Trans. Amer. Ent. Soc., xxix, p. 323, female (in part).
 1909. *Mutilla (Timulla) dubitata* Viereck, John B. Smith's Insects of New Jersey, p. 665, female (in part).
 1916. *Mutilla (Timulla) rufa* Bradley, Trans. Amer. Ent. Soc., xlii, p. 209, male and female (in part).
 1916. *Mutilla (Timulla) hexagona* Bradley, Trans. Amer. Ent. Soc., xlii, pp. 213-214, female (not male).

I have examined and redescribed as follows Smith's type of this species in the British Museum of Natural History:

Female.—Entirely ferruginous; thorax noticeably contracted at the mesonotal area; scutellar scale present and distinct; lateral margins of posterior face of propodeum dentate; basal, lateral, pubescent spots of second tergite obscure; pygidial area longitudinally rugose, the rugae not reaching the distal margin. Length, 8.5 mm.

Head entirely ferruginous, clothed with sparse, recumbent, pale fulvous hairs, and sparse, erect, pale hairs; mandibles edentate at the tips, with a small tooth within, the tips only, black; clypeus elevated posteriorly, the elevated margin arcuate, seen from above slightly sinuate, and somewhat dentate at the sides; flagellum of antennae dusky, the first segment one and one-half times as long as the second; antennal scrobes carinate above; front and vertex with moderate, dense, confluent punctures, the genae with moderate, close punctures; relative widths of head and thorax, 3.4:2.9.

Thorax entirely ferruginous, not at all broader posteriorly than anteriorly; dorsum distinctly contracted at the mesonotal area, the lateral margins slightly crenulate, with large, dense, confluent punctures becoming deeply reticulate on the propodeum, clothed with sparse, recumbent, pale fulvous hairs, and sparse, erect, pale hairs; humeral angles rounded; mesonotal-scutellar suture indistinct; scutellar scale present; lateral margins of posterior face of propodeum dentate; propleura indistinctly punctate, meso-, and metapleura impunctate, sides of

propodeum with moderate, close punctures, and all clothed with sparse, inconspicuous, pale pubescence.

Abdomen ferruginous, the apical portions of the tergites and the pygidium somewhat dusky, but not black; first tergite with sparse, moderate punctures, sparse, pale, erect hairs, and an apical band of appressed, pale pubescence; second tergite with small, shallow punctures, clothed with sparse, recumbent, dark pubescence on the disk, scattered, pale pubescence at the sides, except a pair of obscure, basal, lateral, elongate spots, and a distinct apical band, suddenly, angulately dilated medially at the anterior margin, of appressed, pale pubescence; tergites three to five finely, closely punctate, each with an apical band of appressed, pale pubescence broadly interrupted medially with dark pubescence, that on the third tergite more broadly interrupted than that on the fifth; pygidium longitudinally rugose, the rugae not extending to the apical margin; first sternite with a median, longitudinal carina on the basal half, elevated posteriorly into a blunt tooth; second sternite with moderate, distinct punctures throughout, finely punctate at the apical margin, sparsely clothed with erect, pale hairs, and with an apical fringe of pale hairs; sternites three to five with small, close punctures apically, and each with a thin, apical fringe of pale hairs; last sternite with small, close punctures and erect, pale hairs.

Legs entirely ferruginous, sparsely clothed with pale hairs; calcaria pale.

Male.—Ferruginous, except proximal half of mandibles, clypeus, antennae, front between antennal tubercles, ventral half of mesopleura, propodeum except sides and antero-lateral areas of dorsum, mesosternum, and legs, all black, clothed with sparse, fuscous to black pubescence, except the front anterior to the median ocellus, antennal scrobes, genae, lateral and posterior areas of clypeus and proximal half of mandibles externally, all with sparse, pale, glittering pubescence; mandibles slightly emarginate beneath, but without a strong tooth near the base; mesosternal tubercles somewhat oblique; intermediate coxae with a glabrous ridge on the external lateral margin, and also on the posterior margin, the latter terminating inwardly in a low tubercle; fifth and sixth abdominal sternites with prominent lateral tubercles, the seventh sternite and the hypopygium with conspicuous, lateral, oblique carinae; wings fuliginous. Length, 16 mm.

Head ferruginous, except proximal half of mandibles, clypeus, antennae and front between the antennal tubercles, all black, clothed with pubescence as described above; mandibles slightly but distinctly emarginate beneath and angulate but not toothed near the base beneath; median, glabrous area of clypeus strongly, transversely concave; scape distinctly but delicately bicarinate beneath; first and second segments of flagellum approximately equal in length; antennal scrobes distinctly carinate above; front, vertex and genae with moderately large, dense, confluent punctures, the latter somewhat less dense on the genae than on the front and vertex; ocelli small, the distance between the eye margins and a lateral ocellus approximately four times the greatest diameter of the latter.

Thorax ferruginous, the ventral half of mesopleura, mesosternum, and propodeum except sides and antero-lateral areas of dorsum, black, clothed throughout with sparse, erect, fuscous to black pubescence; pronotum, mesonotum, scutellum and mesopleura for the most part, with moderately large, dense, confluent punctures; parapsidal furrows present and complete from the anterior to posterior margins of mesonotum; enclosed space of dorsum of propodeum well developed, elongate, subrectangular; remainder of propodeum including the sides with large, close, more or less confluent punctures, approaching reticulate; propleura longitudinally rugose, the broad posterior margin glabrous and finely punctate; metapleura micropunctate and micropubescent except the ventral third closely, confluent punctate; tegulae large, glabrous and impunctate except the broad anterior and inner margins closely punctate and black pubescent.

Abdomen ferruginous, clothed throughout with sparse, erect, fuscous to black pubescence, the latter thickest at the posterior margins of the segments, except the sternites with sparse, pale pubescence; first tergite with moderate punctures, close laterally and posteriorly, becoming smaller at the distal margin; tergites three to six with moderate, close punctures, becoming dense and confluent distally; last tergites with moderate, dense, confluent punctures, except a median, narrow, elongate, glabrous, impunctate area terminating in the arms of a Y-shaped carina, the stem of the Y extending to the distal margin and slightly shorter than the arms; first sternite with a distinct, median, longitudinal carina; second sternite with moderately large, close, distinct punctures becoming sparse

medially, and moderate and sparse distally; sternites three to six with moderate, close punctures distally; sternites five and six with prominent, lateral tubercles; sternite seven and the hypopygium with conspicuous, oblique, lateral carinae.

Wings fuliginous; cell 2nd $R_1 + R_2$ long and subtruncate at the apex; cell R_4 present and receiving vein M_2 three-fifths the distance from base to apex; cell R_5 receiving vein M_{3+4} two-thirds the distance from base to apex.

Legs entirely black, sparsely clothed with fuscous to black pubescence; calcaria pale.

Type.—Female, St. John's Bluff, E. Florida (E. Doubleday), in British Museum of Natural History, London.

Allotype.—Male, Orlando, Florida, June 3, 1907, in collection of United States National Museum.

Specimens examined.—

NEW YORK: female, Yaphank, Long Island, September 22, 1911; female, Yaphank, Long Island, September 24, 1911; three females, Cold Spring Harbor, Long Island, June 17, 1923 (E. G. Anderson); male, Cold Spring Harbor, Long Island, July 10, 1921 (S. H. Emerson); male, Cold Spring Harbor, Long Island, July 11, 1921 (E. G. Anderson); male, Cold Spring Harbor, Long Island, September 13, 1922 (E. G. Anderson).

NEW JERSEY: male, Helmetta, September 21, 1909; male, between Stafford's Forge and E. Plains, Ocean Co., August 14, 1929 (Rehn and Hebard); male, Ocean County; male, Clementon, September 10; female, Lakehurst, July 12, 1911 (Wm. T. Davis); female, Jamesburg, July 22, 1912 (Wm. T. Davis); female, Menantico, May 14, 1923 (J. C. Bradley); female, Speedwell, Burlington County, June 20, 1901 (J. A. G. Rehn); female, Camden County, June 20, 1891; two females, Brown's Mills Jr., April 21, 1908 (C. T. Greene); female, Clementon, August 7, 1892; female, Weymouth, July 1, 1926 (H. E. Guerlae); female, Atlantic County, May 29, 1890; three females.

MARYLAND: female, Baltimore; female, Odenton, July 17, 1918 (H. Dietrich); female, Beltsville, May 17 (Frederick Knab); female, Plummer's Island, May 10, 1914 (J. C. Crawford); female, Plummer's Island, August 10, 1902 (Barber and Schwarz); female, Marshall Hall, June, 1898; female, Plum Point, July 4, 1912 (Wm. Palmer); female, Breton Bay, July 12, 1924 (H. S. Barber); female, Bryantown, August 21, 1932 (H. G. Barber).

VIRGINIA: female, Great Falls, April 20; female, Great Falls, May 19; six females, Clifton, July 1-9, 1933 (J. C. Bridwell); two

females, Clifton, July 15-23, 1933 (J. C. Bridwell); two females, Clifton, July, 1933 (J. C. Bridwell); two females, East Falls Church, July 2, 1912; female, Falls Church, August 4; female, Falls Church, August 13, 1914 (G. M. Greene); male, female, Falls Church, August 20, 1913 (C. T. Greene); female, Falls Church, September 1, 1915 (C. T. Greene); female, Falls Church, September 4, 1915 (C. T. Greene); two females, Falls Church, September 11, 1915 (G. M. Greene); female, Nelson County, July 1, 1925 (W. Robinson).

NORTH CAROLINA: female, Black Mountains, August (Beutenmüller); female.

SOUTH CAROLINA: female, Clemson College, August 1, 1927 (B. B. Pepper); female.

TENNESSEE: female, Nashville; female, Monteagle, August 21, 1931 (A. G. Richards); four females.

GEORGIA: female, Stone Mountain, August 16, 1913; female, Talulah Falls, June 19-25, 1909 (J. C. Bradley); male, Clyde, Georgia, September 1-12, 1931 (Bradley and Knorr); male, St. Simon's Island, June 1, 1911; male, St. Simon's Island, June 5, 1929 (P. W. Fattig); male, St. Simon's Island, June 7, 1911; male, Spring Creek, Decatur County, May 18-21, 1916 (J. C. Bradley); male, Spring Creek, Decatur County, June 7-23, 1917 (J. C. Bradley); two females, Spring Creek, Decatur County, July 16-29, 1912 (J. C. Bradley); male, Spring Creek, Decatur County, August 9-12, 1931 (Bradley and Knorr); male, Spring Creek, Decatur County; two females.

FLORIDA: female, Lake Worth; female, Gainesville, Alachua County, April 4, 1913; male, Gainesville, Alachua County, May 10, 1922 (T. P. Winter); male, Agricultural Experiment Station, Gainesville (J. R. W.); female, Palatka, May 3-4, 1916 (J. C. Bradley); female.

MISSISSIPPI: female, Agricultural College, April 12, 1916 (C. D. Coleman); female, Agricultural College, April 28, 1919 (L. V. Colvin); female, Agricultural College, May 8, 1921 (W. S. Anderson); female, Agricultural College, May 15, 1915 (J. C. Powell); female, Agricultural College, June 4, 1919 (B. H. Virden); female, Agricultural College, 1921 (L. W. Jones); female, Columbia, July (B. Morris).

LOUISIANA: female, Orange, September 30, 1906 (F. C. Bishopp).

TEXAS: female, Bexar county, August 10, 1933 (H. B. Parks); three females, Bexar County, August 30, 1933 (H. B. Parks); female, Bexar County, October 2, 1931 (H. B. Parks); female, Bexar

County, October 4, 1933 (H. B. Parks); female, Bexar County, October 20, 1931 (H. B. Parks); male, Colorado County, June 27, 1922 (Grace O. Wiley); male, Beaumont, November 13, 1918 (H. S. Barber); female, Lee County, June 9, 1906; female, Lee County, June, 1908; female, Fedor, September 5, 1897 (Birkman); female, Dallas; male, Paris, October 26, 1904 (C. R. Jones); female.

ARKANSAS: female, Marion County, 1897; female, Marion County, July (Bridwell).

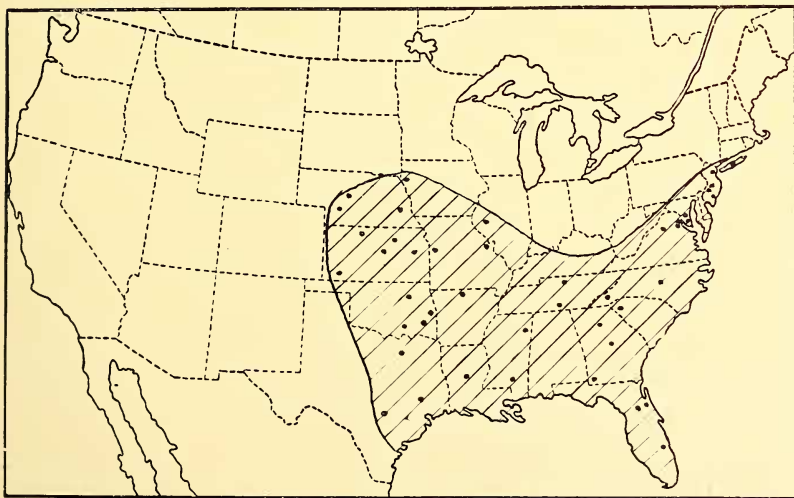
OKLAHOMA: female, Payne County, May 9, 1926 (W. J. Brown); female, Payne County, June 3, 1925 (W. J. Brown); male, female, Payne County, June 24, 1925 (W. J. Brown); female, Latimer County, June 20, 1931 (R. D. Bird); female, Wiley, July 3; female, Stillwater, April 20, 1933 (Reynold Dahms).

ILLINOIS: female, Illinois River, August.

IOWA: female, Sioux City, July 28, 1928 (C. N. Ainslie).

MISSOURI: female, St. Louis (Rau); female, Kansas City, August 17 (F. Rogers).

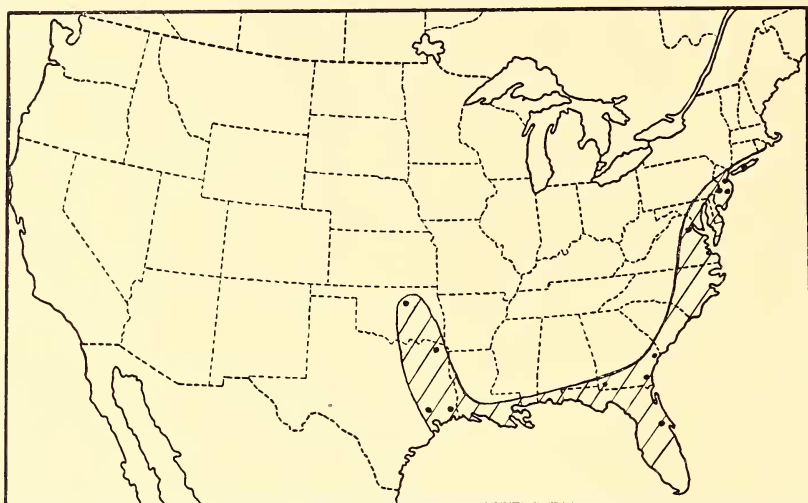
KANSAS: female, Manhattan, May 15, 1920 (H. M. Smith); female, Manhattan, September 19, 1932 (C. W. Sabrosky); female, Riley County, July 3 (Popenoe); female, Riley County, July 21 (Popenoe); two females, Riley County, August 9 (Popenoe); female, Riley County, August 23 (J. B. Norton); female, Lyons County, June 4, 1923 (C. O. Bare); female, Medora, June 9, 1933;



Distribution of *Timulla* (*Timulla*) *dubitata* subsp. *dubitata* (Smith). Females

female, Philipps County, August 30, 1912 (F. X. Williams); female, Seward County, July 21; female (Popenoe).

NEBRASKA: two females, Halsey, August 13, 1925 (R. W. Dawson); female, Halsey, August 14, 1925 (R. W. Dawson); female, Halsey, September 3, 1924 (R. W. Dawson); female, Wallace, July 7, 1931.



Distribution of *Timulla (Timulla) dubitata* subsp. *dubitata* (Smith). Males

The female has been confused in collections with the female of *vagans*, and even with the female of *ferrugata*; it has also been identified by Bradley (1916) as the female of *hexagona*. I have examined Bradley's allotype of *hexagona* and find it to be the same as Smith's *dubitata*. Bradley's allotype was not taken in copula with a male but was correlated with *hexagona* on other evidence which has since proven to be incorrect. The male was identified by Bradley (1916) as Lepeletier's *rufa*. An examination of the type of the latter has shown it to be the male of *ferrugata*. This female and male, and the following subspecies of male were first associated by Bradley (1916) on the basis of specimens collected together but not in copula by Nathan Banks, and on the basis of geographical distribution. The study of the material before me has confirmed that conclusion. The female may be recognized by the elongate thorax, the sides of which are distinctly but not strongly emarginate medially, by the absence of the mesonotal-scutellar suture just anterior to the scutellar scale, the distinct scutellar scale, and the

longitudinally rugose pygidium. The male may be readily recognized by the presence of well-developed tubercles on the fifth sternite, the bicarinate scape without a pubescent brush beneath, and the more or less ferruginous head and thorax. The males vary with respect to the emargination of the mandibles; some are only slightly emarginate with an inconspicuous angular prominence beneath near the base; intergrades occur between that condition and the mandibles broadly, distinctly emarginate beneath with the angular prominence conspicuous and almost forming a tooth. The subspecies in the male sex described below has the head and thorax black and has a more extensive but different geographical distribution. I have attempted to find some morphological character in the females which would separate them into groups having the same geographical distribution as the two subspecies of male, but have been unsuccessful. The females appear to me to be uniform throughout the entire geographic range.

Timulla (Timulla) dubitata subsp. **fugitiva** n. subsp.

1899. *Mutilla hexagona* Fox, Trans. Amer. Ent. Soc., xxv, p. 270, male (in part).

1899. *Timulla hexagona* Ashmead, John B. Smith's Insects of New Jersey, p. 535, male (in part).

1916. *Mutilla (Timulla) rufa* Bradley, Trans. Amer. Ent. Soc., xlii, p. 209, male (in part).

Male.—Exactly like the subsp. *dubitata* except the head and thorax entirely black; emargination of mandibles, form of clypeus, elongate, glabrous area and Y-shaped carina of last tergite, tubercles of fifth and sixth sternites, and carinae of seventh sternite and hypopygium, all the same as in subsp. *dubitata*. Length, 17 mm.

Holotype.—Male, Halsey, Nebraska, August 13, 1925 (R. W. Dawson), in University of Minnesota collection.

Paratypes.—The following specimens.—

NEW JERSEY: male, Gloucester County, August 16, 1891.

PENNSYLVANIA: male, Rockville, August 4, 1912; male, Rockville, August 18, 1912 (Champlain); male, Rockville, August 21, 1910 (H. B. Kirk).

MARYLAND: male, Baltimore, 1870 (Uhler); male, Chestertown, August 12, 1901 (E. G. Vanatta); male, Blythedale, September 18; male, College Park, August 23, 1925 (C. T. Greene).

DISTRICT OF COLUMBIA: male, Rock Creek, October 14, 1904 (C. E. Burden); male, Washington, July 23, 1902 (Bridwell).

VIRGINIA: male, Clifton, July 15-23, 1933 (J. C. Bridwell); male, Barcroft, September 3, 1928 (J. C. Bridwell); male, Falls Church, August 23; male, Falls Church, August 26, 1916 (G. M. Greene); male, Falls Church, August 28; male, Falls Church, August 30; two males, Falls Church, September 1, 1915 (C. T. Greene); two males, Falls Church, September 4, 1915 (C. T. Greene); male, Kerney, August 15, 1913 (Wm. Middleton); two males, Nelson County, July 12, 1928 (W. Robinson); male, Nelson County, August 6, 1925 (W. Robinson).

TENNESSEE: two males, Allardt, Fentress County, August 20, 1922 (T. H. Hubbell); male.

GEORGIA: male, Austell, August 27, 1910.

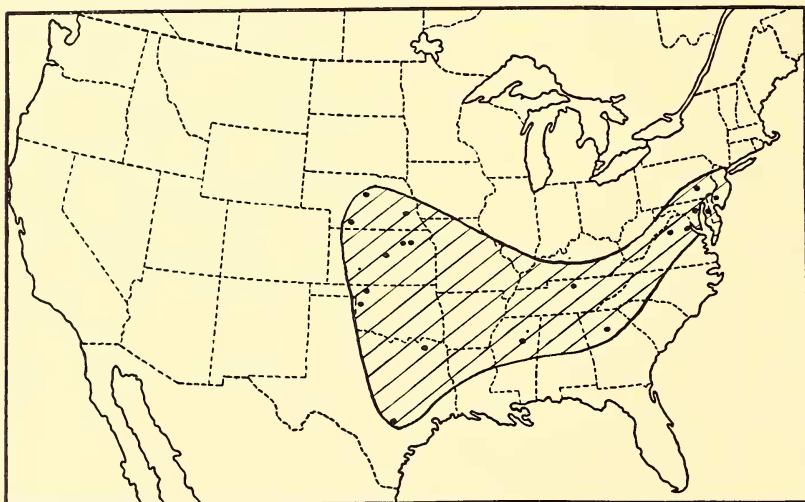
MISSISSIPPI: male.

TEXAS: male, Bexar County, June 12, 1933 (H. B. Parks); male, Paris, June 25, 1933; male, Paris, September 23, 1904 (W. R. Hooker).

OKLAHOMA: male, Woods County, July 5, 1930 (R. D. Bird; male, Shattuck, August 12, 1933 (Reynolds Dahms).

KANSAS: male, Onaga, July 13, 1925 (R. H. Beamer); two males, St. George, July 21; male, Riley County, August 6 (J. B. Norton); male, Riley County, August 19 (Popenoe); two males, Riley County, August 22 (Popenoe); male, Russell County, August 26, 1912 (F. X. Williams).

NEBRASKA: male, Weeping Water, July 20 (H. S. Smith); male,



Distribution of *Timulla* (*Timulla*) *dubitata* subsp. *fugitiva* n. subsp. Males

Halsey, August 12, 1925 (R. W. Dawson); male, Halsey, August 14, 1920 (C. B. Philip); male, Halsey, August 20, 1920 (C. B. Philip); male, McCook, September 3, 1892 (Barber).

The emargination of the mandibles varies as in subsp. *dubitata*, some specimens having the emargination shallow, others more deeply emarginate with a conspicuous angle beneath near the base. As stated above the attempt to find subspecific differences in the females from the same region in which this male subspecies occurs was unsuccessful. Females of *dubitata* from Florida, for example, cannot be separated from females collected in Nebraska, Tennessee or other areas where the species occurs. The males vary in length from 17 mm. to 20 mm.

Timulla (Timulla) wileyae n. sp.

Female.—Head, thorax, legs and abdomen beneath in part, ferruginous; tips of mandibles, flagellum beyond the first segment, abdomen above, and abdomen beneath beyond the second sternite, all black; lateral margins of dorsum of thorax not emarginate medially; scutellar scale present; disk of second tergite finely punctate, and with a pair of anterior, obscure, subcircular, pale pubescent spots, the tergite also with a broad, distal band of dense, appressed, pale pubescence, the anterior margin of the band angularly dilated medially; tergites three to five each with a distal band of pale pubescence attenuated and interrupted medially with black; pygidial area irregularly rugose. Length, 9 mm.

Head entirely ferruginous, except the tips of the mandibles and the flagellum beyond the first segment, blackish, clothed with sparse, erect, ferruginous pubescence, that on the genae paler than that on the front and vertex; mandibles edentate at the apex and with a small tooth within near the apex; clypeus elevated posteriorly, the elevated margin evenly arcuate; scape finely punctate above; first segment of flagellum approximately equal in length to the second and third segments united; antennal scrobes distinctly carinate above; front, vertex and genae with moderate punctures, dense and confluent on the front and vertex, separated and interspersed with fine punctures on the genae; relative widths of head and thorax, 3.3:2.8.

Thorax entirely ferruginous, the dorsum clothed with sparse, erect, ferruginous pubescence, the posterior face of propodeum with sparse, erect, pale pubescence, and the pleural areas with pale micropubescence; humeral angles rounded; dorsum with

moderately large punctures, very dense and confluent anteriorly, less dense medially and posteriorly and becoming reticulate on the posterior face of propodeum; lateral margins of dorsum of propodeum not emarginate medially, the sides parallel; width of thorax at the humeral angles and dorsum of propodeum equal; scutellar scale present and well developed; pleural areas throughout micropunctate, the propleura also with moderate, obscure punctures and the sides of propodeum with moderate punctures separated anteriorly, close posteriorly.

Abdomen black, except the first segment anteriorly above and entirely beneath, and the second sternite entirely, ferruginous; first tergite finely punctate and with scattered small punctures, clothed with sparse, erect, pale pubescence and also with a distal band of dense, appressed, pale pubescence; second tergite finely, closely punctate except the lateral fourths also with moderate, separated punctures, clothed with sparse, appressed, black pubescence except the lateral fourths with the pubescence pale, and also with a pair of anterior, obscurely subcircular spots and a broad, distal band with its anterior margin angularly dilated medially, of dense, appressed, pale pubescence; tergites three to five finely, closely punctate, clothed with sparse, appressed, black pubescence and each with a distal, interrupted band of dense, appressed, pale pubescence, the band on each attenuated and interrupted medially, broadly so on the third and scarcely on the fifth; pygidial segment with sparse, pale pubescence, the pygidial area irregularly rugose; first sternite with a median, longitudinal carina on the anterior two-thirds, the carina distinctly elevated anteriorly into a slight tooth; second sternite with moderately large, close punctures, becoming small and close at the distal margin, clothed with sparse, pale pubescence, and with a thin, distal fringe of pale pubescence; sternites three to five with small, close punctures towards the distal margin and each with a thin, distal fringe of pale pubescence.

Legs entirely ferruginous, sparsely clothed with pale pubescence; calcaria pale.

Holotype.—Female, Rock Island, Texas, June 27, 1922 (Grace O. Wiley), in University of Minnesota collection.

Paratypes.—Texas: female, Willis, May 14, 1903 (Bridwell); female, Willis, May 15, 1903 (Bridwell); female, Willis, May, 1903 (Bridwell); female, Lee County, April 10; female, Mineola, July 19 (C. R. Jones); female, Rosser, June 28, 1905 (C. R. Jones); two females, Dallas (Boll).

LOUISIANA: female, Orange, March 22.

ARKANSAS: female, Hope, June (Louise Knobel).

OKLAHOMA: female, Ardmore, May 18, 1906 (F. C. Bishopp); female, Cherokee, August 8, 1932 (A. E. Pritchard).

Similar to *dubitata* but differs in having the lateral margins of the dorsum of the thorax parallel and not emarginate medially, in the smaller anterior, pale pubescent spots of the second tergite, and the irregularly rugose pygidium. I am pleased to name this species for Mrs. Grace O. Wiley, formerly Curator of Reptiles at the Brookfield Zoological Gardens, Chicago, who collected the holotype specimen.

Timulla (Timulla) nitela n. sp.

Male.—Head, thorax and legs entirely black; abdomen entirely fulvous, sparsely clothed with fulvous pubescence; median area of clypeus transversely concave; mandibles emarginate beneath and with a conspicuous tooth near the base beneath; ocelli small, the distance between the eye margins and the lateral ocelli equal to about four times the greatest diameter of the latter; last tergite with the median, elongate, glabrous area terminating in the arms of a Y-shaped carina, the arms of the Y about equal in length to the stem; hypopygium with a pair of prominent, oblique carina, the seventh sternite with a pair of lateral, cariniform tubercles, the sixth sternite with a pair of small, lateral tubercles; intermediate coxae with a distinct tooth at the inner, posterior margin; wings subhyaline with a slightly darker band apically. Length, 13 mm.

Head entirely black, sparsely clothed with short, appressed and long, erect, pale, glittering pubescence; mandibles and clypeus as above; first segment of flagellum slightly shorter than the second; scape distinctly bicarinate beneath; front and vertex with moderate, dense, slightly confluent punctures, the genae with slightly smaller, contiguous but scarcely confluent punctures; ocelli as above; antennal scrobes carinate above; relative widths of head and thorax at the tegulae, 4.7:5.7.

Thorax entirely black, sparsely clothed with pale, glittering pubescence, except the posterior two-thirds of mesonotum and anterior middle of scutellum with sparse, black pubescence; pronotum, mesonotum and scutellum with moderately, large, dense, slightly confluent punctures; parapsidal furrows present and distinct, shallow anteriorly, deep posteriorly; enclosed space of dorsum of propodeum elongate, triangular; remainder of dorsum of propodeum and posterior face of propodeum

reticulate; propleura glabrous, micropunctate and faintly transversely rugose; mesopleura micropunctate throughout and with moderate, close, shallow punctures, except at the anterior margin; metapleura micropunctate except for moderate, close punctures ventrally; sides of propodeum with moderate, shallow punctures except the anterior margin only micropunctate; mesosternal tubercles well developed, transverse; tegulae large, convex, glabrous, impunctate, except the anterior and inner margins punctate and with sparse, pale pubescence.

Abdomen entirely fulvous, sparsely clothed with fulvous pubescence; first tergite with moderately large, distinct punctures; second tergite with similar punctures but becoming small and close towards the posterior margin; tergites three to six with moderately small, distinct punctures; last tergite with a Y-shaped carina as above, the posterior margin emarginate each side of the stem of the Y; first sternite with a distinct, longitudinal, median carina; second sternite with moderately large, close, somewhat confluent punctures; sternites three to six with small, close punctures posteriorly; sternites six and seven, and the hypopygium armed as described above.

Wings subhyaline with a distal, marginal darker band; cell 2nd $R_1 + R_2$ subtruncate at the apex; cell R_5 receiving vein M_{3+4} two-thirds the distance from base to apex; cell R_4 present and receiving vein M_3 almost two-thirds the distance from base to apex.

Legs entirely black, sparsely clothed with pale pubescence; intermediate coxae with a low carina at the posterior margin terminating at the inner margin in a distinct tooth; calcaria pale.

Holotype.—Male, Douglas, Arizona, August 7, 1933 (W. W. Jones), in University of Minnesota collection.

Paratypes.—Two males, Douglas, Arizona, August 7, 1933 (W. W. Jones).

Very similar in appearance to *neobule*, the following species, but has the wings slightly darker, the clypeus transversely concave, the head and thorax more sparsely pubescent, the tarsi entirely black, and the sides of propodeum with shallow punctures.

Timulla (Timulla) neobule n. sp.

Male.—Head and thorax black, abdomen fulvous, legs black except the intermediate and posterior tarsi ferruginous; median, impunctate area of last tergite terminating in the flaring arms of a Y-shaped carina, the arms of the Y about equal in

length to the stem; sixth sternite with a pair of small, lateral tubercles; seventh sternite with the lateral tubercles large; hypopygium with a pair of lateral, oblique, polished ridges terminating posteriorly in distinct tubercles. Length 12 mm.

Head black; front below the ocelli, posterior part of vertex, and genae with appressed, pale pubescence, as well as sparse, erect, pale hairs, the appressed pubescence densest on the front; anterior part of vertex with sparse, erect, pale hairs; mandibles edentate at the tip and with a small tooth within near the tip, emarginate beneath and with a prominent tooth near the base beneath; median area of clypeus depressed medially, thus concave, the posterior and lateral margins higher than the center and evenly arcuate; scape bicarinate beneath, the two carinae about equally developed; first and second segments of flagellum approximately equal in length; antennal scrobes weakly carinate above; front, vertex and genae with moderate, close punctures; ocelli moderate in size, the distance between the eye margins and the lateral ocelli two and two-thirds times the greatest diameter of the latter; relative widths of head and thorax at the tegulae, 4.4: 5.5.

Thorax black; pronotum densely, confluent punctate, clothed throughout with appressed, pale pubescence, and sparse, erect, pale hairs; humeral angles rounded; mesonotum densely, confluent punctate, clothed with sparse, erect, black hairs, except the anterior third with appressed, pale pubescence and sparse, erect, pale hairs; parapsidal furrows distinct; scutellum evenly convex, not gibbose, densely, confluent punctate throughout, clothed with sparse, erect, black hairs at the base medially, elsewhere with sparse, erect, pale hairs; proximal portion of propodeum with appressed, pale pubescence, elsewhere with sparse, erect, pale hairs; enclosed area of propodeum distinct, the sides parallel, not elevated posteriorly into a tubercle; lateral margins of dorsum of propodeum not defined by a raised, polished line; dorsum and posterior face of propodeum distinctly reticulate; anterior margin of propleura defined by a weak carina; propleura shallowly punctate anteriorly, weakly, transversely rugose posteriorly; mesopleura elevated, the elevated portions with shallow, dense, confluent punctures, and sparse, erect and appressed pale pubescence; metapleura impunctate dorsally, distinctly, shallowly punctate ventrally; sides of propodeum moderately, shallowly reticulate except the anterior margin; tegulae smooth, polished, the basal and inner margins with pale pubescence.

Abdomen fulvous; first tergite with sparse, moderate punctures, sparse, erect, pale hairs and a thin, apical fringe of fulvous hairs; second tergite impunctate on the median line, with moderate, distinct punctures elsewhere, clothed with sparse, erect, fulvous hairs, except the distal fourth slightly depressed and clothed with sparse, fulvous pubescence, the distal margin with a fringe of fulvous hairs; tergites three to six with moderate, close punctures, sparse, erect, fulvous hairs, and each with a distal fringe of fulvous hairs; last tergite densely punctate at the sides, with sparse, erect, fulvous hairs; median, impunctate area terminating in the flaring arms of a Y-shaped carina, the stem of the latter extending to the distal margin, the latter somewhat produced medially; arms of the Y-shaped carina about equal in length to the stem; first sternite with a median, longitudinal carina on the proximal two-thirds; second sternite with large punctures, sparse medially, close at the sides; sternites two to seven closely punctate at the distal margin and each with a thin, distal fringe of pale hairs; lateral tubercles of sixth sternite small but distinct, those of the seventh sternite moderate and elongate, the last sternite with a pair of anterior, oblique, lateral polished ridges terminating in distinct tubercles posteriorly.

Wings subhyaline, cell 2nd $R_1 + R_2$ indistinctly truncate at the apex; cell R_5 receiving vein M_{3+4} slightly beyond the middle; cell R_4 present but less distinct than R_5 and receiving vein M_2 slightly beyond the middle.

Legs black, except the intermediate and posterior tarsi distinctly ferruginous, sparsely clothed with pale hairs; calcaria pale. Intermediate coxae with a distinct, inner, distal tooth.

Holotype.—Male, Cat. no. 50949, U. S. National Museum, Los Mochis, Sinaloa, Mexico, July 15, 1922 (C. T. Dodds).

Paratypes.—Three males, Tucson, Arizona (F. H. Snow); male, Pima County, Arizona, September 30, 1925 (Neva Schultz); eleven males, Mesa, Arizona, October 11, 1925 (A. A. Nichol); male, Mesa, Arizona, October 28, 1925 (A. A. Nichol).

Similar in appearance to *oajaca* and other species having the head and thorax black with the abdomen mostly fulvous; differs from all but *nitela* in having the first abdominal segment also fulvous, and in the ferruginous middle and hind tarsi; very close to *nitela* but differs in having the median area of clypeus concave only at the middle and not transversely concave, in the ferruginous tarsi, and in the reticulate sides of the propodeum.

Timulla (Timulla) nicholi n. sp.

Female.—Entirely ferruginous, except the flagellum beyond the first segment, the tips of the mandibles, and the disk of all the abdominal tergites, blackish; lateral margins of dorsum of thorax not emarginate medially; scutellar scale present; second tergite with moderately large, separated punctures interspersed with fine punctures; first and second tergites with a distal band of dense, pale pubescence, the second also with a pair of linear marks of pale pubescence on the anterior half; tergites three to five each with a pair of subquadrate spots of pale pubescence; pygidial area granulate. Length, 9 mm.

Head entirely ferruginous, except the tips of the mandibles and flagellum beyond the first segment blackish, clothed with sparse, erect, ferruginous pubescence, the genae also with inconspicuous, pale, appressed pubescence; mandibles edentate at the tip and with a small tooth within near the tip; clypeus elevated posteriorly, the elevated margin arcuate; scape obscurely punctured; first segment of flagellum approximately equal in length to the second and third segments united; antennal scrobes carinate above; front, vertex and genae with large, dense, confluent punctures, those on the genae slightly smaller than those on the front; relative widths of head and thorax, 3.5:3.2.

Thorax entirely ferruginous, the dorsum clothed with sparse, erect, ferruginous pubescence, the posterior face of propodeum with sparse, erect, pale pubescence, and the pleural areas with sparse, pale micropubescence; humeral angles rounded; lateral margins of dorsum of thorax irregularly crenulate; dorsum of thorax with large, coarse, dense, confluent punctures, approaching longitudinally rugoso-punctate, and becoming reticulate and asperated on the posterior face of propodeum; scutellar scale present; lateral margins of posterior face of propodeum dentate; pleural areas throughout micropunctate, the propleura with obscure, moderate punctures anteriorly, and the sides of propodeum with moderate, separated punctures posteriorly.

Abdomen ferruginous, the disk of the tergites blackish to black; first tergite with moderate, separated punctures and sparse, erect, pale pubescence, except the distal margin finely punctate and with a band of dense, appressed, pale pubescence; second tergite with moderately large, separated punctures interspersed with fine punctures, the larger punctures becoming more closely spaced and the fine punctures eliminated towards the lateral margins; second tergite with sparse, erect and appressed,

black pubescence on the disk, sparse, erect, pale pubescence on the lateral thirds, and with a pair of broad lines on the anterior half together with a broad, distal band of dense, appressed, pale pubescence, the anterior margin of the distal band only slightly sinuate; tergites three to five finely punctate and with scattered, moderate punctures intermixed, clothed with sparse, erect and appressed, black pubescence medially, sparse, erect, fuscous pubescence at the sides with a few pale hairs at the lateral margins and each with a pair of large, subquadrate spots of dense, appressed, pale pubescence, the spots converging towards the tip of the abdomen but those on tergite five widely separated; pygidial segment with sparse, erect, pale fuscous pubescence, the pygidial area granulate throughout; first sternite with a median, longitudinal carina slightly elevated medially; second sternite with moderate, sparse punctures, the distal margin with moderately small, close punctures and a thin fringe of pale pubescence; sternites three to five with moderately small, close punctures towards the distal margin and each with a thin distal fringe of pale pubescence.

Legs entirely ferruginous, sparsely clothed with pale pubescence; calcaria pale.

Holotype.—Female, Mesa, Arizona, October 11, 1925 (A. A. Nichol), in University of Minnesota collection.

Paratypes.—Female, Phoenix, Arizona, June 11, 1927 (A. A. Nichol); female, Douglas, Arizona, San Bernardino ranch, August (F. H. Snow).

Somewhat similar to *oajaca* Blake but much less coarsely punctured on the second tergite than that species, the anterior margin of the pale distal pubescent band of the second tergite almost straight and not strongly sinuate as in *oajaca*, the pale pubescent spots on tergites three to five larger and more distinctly quadrate than in *oajaca*, and the legs paler ferruginous. The two paratypes have the first abdominal tergite ferruginous. It gives me great pleasure to name this species for my friend Mr. A. A. Nichol who collected the holotype and one paratype.

This is probably the female of *neobule*. Mr. Nichol has collected both species at the same time and place, and the evidence gained by the process of elimination indicates that *nicholi* and *neobule* are probably the two sexes of the same species.

Timulla (*Timulla*) *oajaca* (Blake). (New combination)

1871. *Mutilla oajaca* Blake, Trans. Amer. Ent. Soc., iii, p. 228, male (nec female).

1886. *Mutilla oajaca* Blake, Trans. Amer. Ent. Soc., xiii, p. 196, male (nec female).
1894. *Mutilla oajaca* Cameron, Biol. Centr.-Amer., Hymen., ii, p. 274, male (nec female).
1897. *Mutilla oajaca* Dalla Torre, Cat. Hymen., viii, p. 67, male (nec female).
1899. *Mutilla nestor* Fox, Trans. Amer. Ent. Soc., xxv, p. 271, male. (New synonymy).
1903. *Mutilla nestor* André, Gen. Ins., i, fasc. 11, p. 42, male.
1903. *Mutilla oajaca* André, Gen. Ins., i, fasc. 11, p. 42, male (nec female).
1903. *Mutilla nestor* Melander, Trans. Amer. Ent. Soc., xxix, p. 323, male.
1904. *Mutilla ornata* Howard, The Insect Book, Pl. viii, fig. 21, female. (New synonymy).
1916. *Mutilla (Timulla) nestor* Bradley, Trans. Amer. Ent. Soc., xlii, p. 211, male.
1916. *Mutilla (Timulla) oajaca* Bradley, Trans. Amer. Ent. Soc., xlii, p. 212, male.

Type.—Male, Mexico (F. Sumichrast), in collection of American Entomological Society, Philadelphia. The type of *nestor* is also at Philadelphia.

Female.—Entirely ferruginous; head with moderate, dense punctures; antennal scrobes carinate above; lateral margins of dorsum of thorax very feebly, almost not at all emarginate medially; thorax not broader posteriorly than anteriorly, the lateral margins parallel; dorsum of thorax with large, dense, confluent punctures; scutellar scale present and distinct; dorsum and posterior face of propodeum coarsely reticulate, the lateral margins of the posterior face of propodeum denticulate; pleural areas glabrous, micropunctate, except the sides of propodeum with sparse, moderate punctures becoming close and confluent at the posterior margin; second abdominal tergite with moderate, dense, somewhat confluent punctures; distal margin of first tergite with a narrow band, distal margin of second tergite with a broad band sinuate anteriorly, and tergites three to five each with a pair of longitudinal, rectangular spots widely separate on three and somewhat approximate on five, all of dense, appressed, pale pubescence; pygidial area irregularly rugose on the anterior half, distinctly granulate on the posterior half; second tergite with moderately large, somewhat confluent punctures. Legs ferruginous, sparsely clothed with pale hairs.

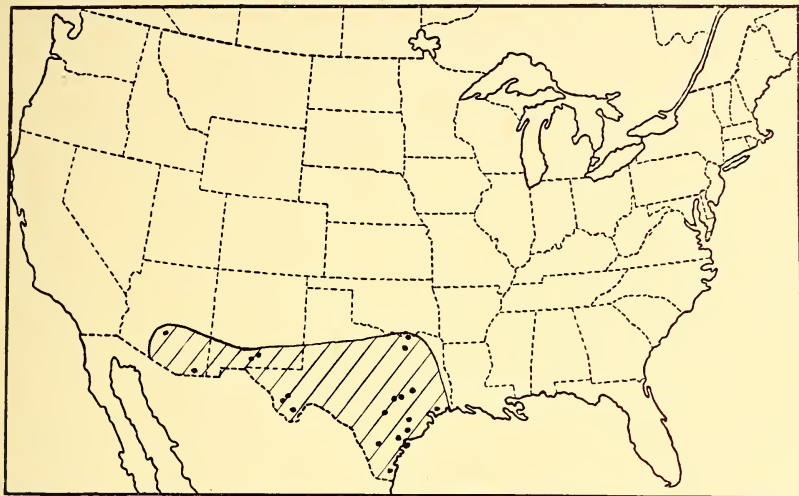
Allotype.—Female, in copula with male, Cotulla, Texas, May 11, 1906 (J. C. Crawford), in collection of U. S. National Museum.

Specimens examined.—

TEXAS: female, Riviera, July 17, 1921 (F. M. Hull); female, Calhoun County, March and April, 1902 (J. D. Mitchell); male, Calhoun County (J. D. Mitchell); female, Victoria, June 19, 1913 (J. D. Mitchell); two males, Victoria, April 17, 1907 (W. E. Hinds); male, Victoria, August 28, 1915 (A. McLaughlin); female, Smith Point, August 19, 1918 (E. L. Diven); female, Columbus; female, Colorado County, April 21, 1922 (Grace O. Wiley); male, Colorado County, August 18, 1922 (Grace O. Wiley); female, Colorado County, September 5, 1922 (Grace O. Wiley); female, Bexar County, June 11, 1933 (H. B. Parks); two females, Bexar County, August 30, 1933 (H. B. Parks); male, San Antonio, September 11 (J. C. Crawford); female, Elmendorf, June 1 (A. W. Morrill); female, Anhalt, Comal County, June 29, 1917; female, Bryan, July 7, 1906 (J. C. Crawford); male, College Station, May 29, 1920 (H. J. Reinhard); male, College Station, June 10, 1919 (H. J. Reinhard); male and female (in copula), College Station, July 10, 1931 (H. J. Reinhard); female Bastrop, May 9, 1921 (R. H. Painter); male, Lee County, August 7, 1905; male, Lee County, September 1; male, Lee County, September 7; two males, Lee County, September 7, 1905; male, Lee County, September 16, 1905; female, Fedor, April 13, 1898 (Birkman); two males, Fedor, September 7, 1905; male, Fedor, September, 1900; male, Fedor, September; male and female, Fedor; female, Dallas, September 19, 1918 (T. H. Hubbell); female, Dallas, October 7, 1906 (F. C. Bishopp); male, Dallas, October 9, 1905 (F. C. Bishopp); female, Dallas (Boll); female, Bonham, June 20, 1933; female, Sherman, September 30, 1908 (E. S. Tucker); female, Cypress Mill; female, McKinney, September 8, 1920 (R. H. Painter); two females, Chisos Mts., Brewster County, June 10–12, 1908 (Mitchell and Cushman); male, Limpia Canyon, Davis Mts., July 7, 1917; male, Musquiz Canyon, Ft. Davis, July 6, 1917; male and female, Cherry Canyon, Fort Davis Quad, Davis Mts., June 27, 1916 (F. M. Gaige); female, Cherry Canyon, Fort Davis Quad, Davis Mts., June 28, 1916 (F. M. Gaige); three females, Cherry Canyon, Fort Davis Quad, Davis Mts., June 29, 1916 (F. M. Gaige); male, Ft. Davis, Jeff Davis County, Davis Mts., July–August, 1927–28 (Mrs. O. C. Poling); male, Valentine, July 3, 1933 (S. E. Jones); male and female (taken together), and female, Valentine, July 8, 1917; three males, six females.

NEW MEXICO: two females, Mesilla Park, August 12 (Cockerell); female, Mesilla Park, September 24; female, Organ Mts., August 30.

ARIZONA: male, Douglas, August 7, 1933 (W. W. Jones); male, Douglas, August (F. H. Snow); female, Phoenix, September 24, 1928; female, Phoenix, October 20, 1928 (O. L. Barnes).



Distribution of *Timulla* (*Timulla*) *oajaca* (Blake)

The types of *oajaca* and *nestor* have been compared with each other and studied in comparison with additional specimens from the United States and Mexico. The type of *nestor* is a small specimen of *oajaca*. Occasionally small specimens of *oajaca* are taken in Texas which seem to have relatively small ocelli, but otherwise there are no structural differences between these small specimens and larger ones taken at or near the same locality.

The female described by Blake as *oajaca* is certainly not the opposite sex of this male. The sexes have been collected twice while mating as noted above and there can be no question that the female described above is the true one for this male *oajaca*. I have also seen a specimen of this same female taken at the same time and place as a male of *oajaca* at Santiago Iscuintla, Jalisco, Mexico. The specimen figured by Howard, Pl. viii, Fig. 21, The Insect Book, is before me and proves to be this same female.

The males can be recognized at once by the exceedingly short arms of the Y-shaped carina on the last tergite and the tuberculate intermediate coxae; the form of the clypeus is also characteristic, the posterior, elevated margin of the polished area being angulate and produced or reflexed laterally. The female may be recognized

by the coarse puncturation of the second abdominal tergite, the rugose pygidium, and the carina of the first sternite entire.

Timulla (*Timulla*) *floridensis* (Blake). (New combination)

1879. *Mutilla floridensis* Blake, Trans. Amer. Ent. Soc., vii, p. 249, male.

1886. *Mutilla floridensis* Blake, Trans. Amer. Ent. Soc., xiii, p. 199, male.

1897. *Mutilla floridensis* Dalle Torre, Cat. Hymen., viii, p. 41, male.

1899. *Mutilla floridensis* Fox, Trans. Amer. Ent. Soc., xxv, p. 271, male.

1903. *Mutilla floridensis* André, Gen. Ins., i, fasc. 11, p. 42, male.

1916. *Mutilla* (*Timulla*) *floridensis* Bradley, Trans. Amer. Ent. Soc., xlii, p. 209, male.

Female.—Entirely ferruginous; thorax distinctly wider posteriorly than anteriorly, the relative widths at humeral angles and dorsum of propodeum, 3.1:3.4; lateral margins of thorax shallowly emarginate medially, distinctly crenulate; scutellar scale present; head with moderate, dense, confluent punctures; dorsum and posterior faces of propodeum coarsely rugoso-reticulate, their lateral margins denticulate; pleural areas glabrous, micropunctate, the sides of propodeum with small, scattered punctures and becoming rugose at the posterior margin; second tergite with moderate, distinct, deep punctures throughout interspersed with fine punctures; band at distal margin of first tergite, a pair of longitudinal lines on the second tergite extending from the anterior margin to slightly beyond the middle, a broad band at distal margin of second tergite angularly produced at the anterior middle, and a pair of longitudinal rectangular spots on tergites three to five arranged in the form of a V, with those on tergite five only slightly separated, all of dense, appressed, pale, glittering pubescence; pale spots on tergites three to five obscurely connected to lateral margins of those tergites by obscure, pale pubescence; sternites two to five with thin, distal fringes of pale hairs; pygidial area faintly granulate; first sternite with a median, longitudinal carina on the anterior two-thirds, the elevated margin straight; second sternite with large, close punctures, becoming smaller, dense and confluent at the distal margin; legs entirely ferruginous. Length, 7 mm.

Type.—Male, Florida, in collection of American Entomological Society, Philadelphia.

Allotype.—Female, in copula with male, Crescent City, Florida, July 8 (H. G. Hubbard), in U. S. National Museum.

Specimens examined.—

CAROLINA: male and female.

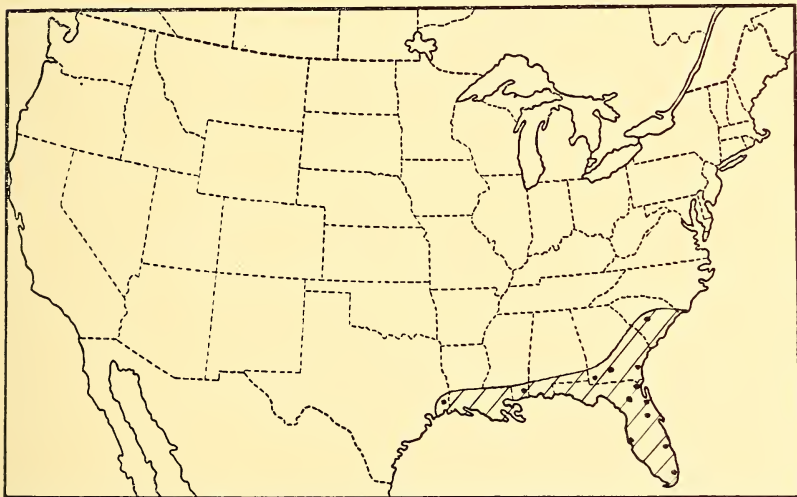
SOUTH CAROLINA: female, Swansea, August 4, 1911 (Frederick Knab).

GEORGIA: male, Tifton; male, St. Simon's Island, June 9, 1911; female, Spring Creek, Decatur County, July 16–29, 1912; male.

FLORIDA: male, Jacksonville; male, Biscayne Bay; male, Gainesville, Alachua County, May 3, 1922 (T. P. Winter); male and female, St. Leo, October 22, 1907 (Russell); male, St. John's County, March, 1891; female, Capron, September 18; male and female, Dunedin, September 30, 1914 (W. S. Blatchley); female, Enterprise, May 14; male, Martin County, March 15, 1930 (B. F. Mizell); female.

MISSISSIPPI: female, Lucedale, March 29, 1932 (H. Dietrich).

TEXAS: female, Silsbee, June 25, 1918 (E. L. Diven).



Distribution of *Timulla (Timulla) floridensis* (Blake)

The males may be recognized by the bicarinate scape, ferruginous thorax, excised mandibles, vertically placed ocelli and Y-shaped carina of last tergite with the arms of the Y much shorter than the stem; the latter is very similar to the structure of the last tergite in *oajaca* Blake. The females may be recognized by the slightly emarginate lateral margins of dorsum of thorax, the thorax distinctly

broader behind, the coarsely punctate second tergite and the faintly granulate, almost glabrous pygidium. The females vary in length from 5.5 to 10 mm.

Timulla (*Timulla*) *barbigera* subsp. *barbigera* (Bradley). (New combination)

1916. *Mutilla* (*Timulla*) *barbigera* Bradley, Trans. Amer. Ent. Soc., xlii, pp. 206–207, male.

Female.—Head and thorax ferruginous; abdomen more or less black; legs ferruginous except tips of femora, tibiae and tarsi blackish; first tergite with a broad, distal band, second tergite with a pair of anterior, narrow, elongate spots on the anterior half and a broad band at the distal margin, the anterior margin of the band sinuate and strongly, acutely produced anteriorly at the middle, and tergites three to five with a broad band at the distal margin, that on three attenuated and broadly interrupted medially, that on four attenuated and narrowly interrupted medially, that on five attenuated and very narrow medially but not interrupted, all of dense, appressed, pale, glittering pubescence; dorsum of thorax very convex, the lateral margins strongly emarginate; scutellar scale obsolete; pygidial area longitudinally rugose; carina of first sternite produced anteriorly into a very prominent tooth. Length, 15 mm.

Head entirely ferruginous except the tips of the mandibles and flagellum distad of segment one, black; mandibles slender, edentate at the apex, with a distinct tooth within remote from the apex, not emarginate nor toothed beneath; clypeus elevated posteriorly into a transverse, strongly arcuate, slightly crenulate ridge; scape with small, close punctures above; first segment of flagellum slightly shorter than segments two and three united; antennal scrobes distinctly carinate above; front, vertex and genae with moderately large, dense, confluent punctures, clothed with sparse, short, suberect, and very scattered, long, erect, dark ferruginous pubescence, except that on the genae pale and glittering; relative widths of head and thorax, 5.3:5.3.

Thorax entirely ferruginous, the lateral margins strongly emarginate medially, and the dorsum slightly wider posteriorly than anteriorly; relative widths of thorax at humeral angles, anterior spiracles, just posterior to anterior spiracles, narrowest part of mesonotal area, and dorsum of propodeum, 4.5, 5.0, 4.6, 4.0, 5.3; humeral angles strongly rounded, not prominent; mesonotal-scutellar suture present but not conspicuous; scutel-

lar scale obsolete; dorsum of propodeum strongly convex, with large, dense, confluent punctures, tending to longitudinally rugoso-punctate, the punctures becoming coarser and deeper on the dorsum of propodeum and anterior half of posterior face of propodeum, the latter with distinct asperities; dorsum of thorax clothed with sparse, short, suberect, ferruginous pubescence; lateral margins of dorsum and posterior face of propodeum serrate; anterior margin of propleura not defined by a carina; propleura with moderate, close, confluent punctures anteriorly, micropunctate posteriorly; mesopleura and metapleura micropunctate throughout; sides of propodeum with moderate, close, confluent punctures posteriorly, the punctures becoming sparser and shallower anteriorly, the anterior area micropunctate; all the pleural areas pale micropubescent.

Abdomen black, the anterior two-thirds of first tergite, large, ovate, lateral spots on second tergite, first sternite and second sternite, all ferruginous; pubescent pattern of tergites as described above; first tergite with moderate punctures, close laterally and posteriorly, sparse medially and interspersed with fine punctures; second tergite with moderate, close punctures interspersed with very small, dense punctures; tergites three to five with moderately small, separated punctures interspersed with small, dense punctures; pygidial area longitudinally rugose; first sternite with the median, longitudinal carina produced anteriorly into a strong, prominent tooth; second sternite with moderately large, close, confluent punctures becoming dense anteriorly and laterally, the coarsely punctate area terminating distally at a narrow, transverse, submarginal, irregular, glabrous area, the broad, distal margin slightly depressed, with moderate separated punctures, interspersed with fine, dense punctures and clothed with thick, appressed, pale pubescence; sternites three to five with moderate, close punctures distally, and each with an apical fringe of pale pubescence; hypopygium ferruginous and with moderate, dense punctures.

Legs ferruginous, except the tips of the femora, tibiae and tarsi, blackish; posterior femora darker ferruginous than the anterior and intermediate ones; legs clothed with sparse, pale, glittering pubescence; calcaria ferruginous.

Holotype.—Male, Dallas, Texas, in collection of American Entomological Society, Philadelphia.

Allotype.—Female, Colorado County, Texas, August 21 (Grace O. Wiley), in collection of University of Minnesota.

Specimens examined.—

VIRGINIA: females, Seven Pines, August 8, 1916 (Wm. T. Davis).

NORTH CAROLINA: female, Raleigh, mid-July (C. S. Brimley); male, Raleigh, early September (C. S. Brimley).

SOUTH CAROLINA: male, Clemson College, October 26, 1926 (D. Dunavan).

FLORIDA: male and female (in copula), Miami, June 2, 1928.

MISSISSIPPI: female, Agricultural College, April 15, 1925 (G. R. Fulton); female, Agricultural College, April 13, 1921 (C. A. Rose); female, Agricultural College, July 26, 1915 (G. F. Arnold); male, Agricultural College, September, 1919 (W. W. Porter); two males, Agricultural College, October 5, 1919 (R. J. Smith); male, Agricultural College, October 7, 1920 (J. W. Hollandsworth); female, Agricultural College, November 16, 1917 (J. H. Williams); female, Jones County, July 20, 1910 (J. C. Reddoch).

LOUISIANA: female, Tallulah, July 31, 1925 (B. E. Montgomery); male, Johnson's Bayou, August 24, 1906 (J. D. Mitchell).

TEXAS: male and female, Devers, June 21, 1917; male and female (in copula), Willis, June 18, 1903 (Bridwell); female, Bexar County, August 4, 1933 (H. B. Parks); two females, College Station, August 18, 1932 (S. Bromley); male, Paris, September 5, 1904 (F. C. Bishopp); male, Colorado County, June 3, 1922 (Grace O. Wiley); male, Colorado County, August 18, 1922 (Grace O. Wiley); male, Madison County, August 11, 1930 (Bibby and Tate); male and female, Dallas (Boll); female, Texas (Belfrage); four males.

OKLAHOMA: male, Payne County, July 5, 1925 (W. J. Brown); female, Boise City, July 10, 1933 (R. Dahms).

KANSAS: female, Chautauqua County (R. H. Beamer); female, Cherrivale (H. B. Hungerford); female, McPherson; two females, Hamilton County (F. H. Snow); female, Hamilton County (S. J. Hunter); female, Sherman County, August 1, 1925 (R. H. Beamer); two females, western Kansas (Popenoe); female (Snow).

SOUTH DAKOTA: female, Capa, September 11, 1917 (H. C. Severin).

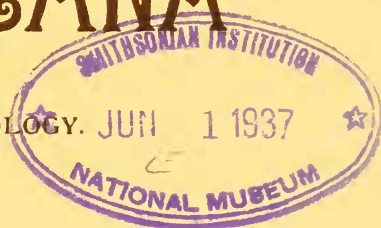
(To be Continued on Page 57)

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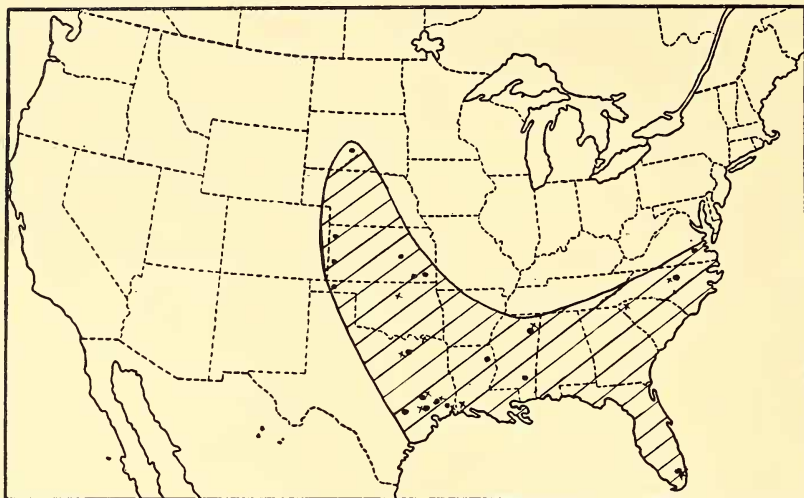
No. 2

THE MUTILLID WASPS OF THE GENUS *TIMULLA* WHICH OCCUR IN NORTH AMERICA NORTH OF MEXICO

BY CLARENCE E. MICKEL
UNIVERSITY OF MINNESOTA

(Continued from Page 56)

The female averages larger in size than any of this genus occurring in North America north of Mexico, the length varying from 10 to 17 mm. The thorax of the larger specimens is slightly wider posteriorly than anteriorly, as in the allotype, but in the smaller ones the width anteriorly and posteriorly is the same. The color of the abdomen varies from the black described for the allotype to extensive ferruginous; in the most ferruginous ones the second tergite except the distal margin, and all the sternites are entirely ferruginous. This female is very similar in appearance to the female of *dubitata* Smith but lacks the scutellar scale which is well developed in the latter, has the lateral margins of the thorax more strongly emarginate, and has the second tergite more strongly punctate. An attempt has been made to find some basis for separating the Kansas female specimens of *barbigera* from the others, as the male subspecies *rohweri* is known only from Kansas, but no differences could be found between the Kansas specimens and the ones from other states. Specimens from the series of males have been compared with the holotype and found to be the same. The pubescent brush of the scape, the Y-shaped carina of the last tergite in which the stem of the Y is shorter than the arms, and the absence of distinct tubercles on the fifth sternite are characters which will serve in distinguishing *barbigera* from species which superficially resemble it.



Distribution of *Timulla* (*Timulla*) *barbiger* subsp. *barbiger* (Bradley)
x = males. • = females.

Timulla (*Timulla*) *barbiger* subsp. **rohweri** n. subsp.

1871. *Mutilla rufa* Blake, Trans. Amer. Ent. Soc., iii, p. 257, male.
1886. *Mutilla rufa* Blake, Trans. Amer. Ent. Soc., xiii, pp. 201–202, male.
1897. *Mutilla rufa* Fox, Trans. Amer. Ent. Soc., xxv, p. 271, male.

Male.—Exactly like typical *barbiger* in the form of the scape and its pubescent brush, clypeus, tegulae, glabrous area and Y-shaped carina of last tergite, the tubercles of the sixth and seventh sternites, and the carinae of the hypopygium; differs in having the anterior fourth to third of the second abdominal tergite black, the second sternite almost entirely black, and the front, vertex, pronotum, mesonotum, scutellum, tegulae and the abdomen above and beneath (except the first tergite, first sternite and second sternite with sparse, erect, pale pubescence) all with erect and appressed, fulvous pubescence.

Holotype.—Male, Cat. No. 50947 U. S. National Museum, Kansas (Snow).

Paratypes.—Male, Russell County, Kansas, August 26, 1912 (F. X. Williams); male, Grant County, Kansas, July 23, 1911 (F. X. Williams); male, Grant County, Kansas, July 27, 1911 (F. X. Williams); male, Stanton County, Kansas, July 30, 1911 (F. X. Wil-

liams); four males, Morton County, Kansas, August 5, 1911 (F. X. Williams); male, Wallace County, Kansas (F. H. Snow); four males, Kansas (Snow); male, Kenton, Oklahoma, June 26, 1933 (Edward Ivy); male, Boise City, Oklahoma, July 10, 1933 (A. E. Pritchard); two males, without locality data.

The above synonymy is based on a single specimen without locality label in the American Entomological Society collection and labeled by Blake as *Mutilla rufa* Lep. This specimen is mentioned by Fox (1897) and tentatively accepted by him as *rufa*. I have examined this specimen and compared it with the specimens listed above and there is no doubt but that the two are the same. Specimens of this subspecies are known only from western Kansas and extreme western Oklahoma. The one specimen of *barbigera* which I have seen from central Oklahoma is without question the subsp. *barbigera*. The two are easily separated by the color of the pubescence as mentioned above. I am happy to dedicate this subspecies to my friend Mr. S. A. Rohwer who first recognized this form as distinct.

Timulla (Timulla) compressicornis n. sp.

Male.—Head above the insertion of antennae, prothorax, mesonotum, most of scutellum and abdomen beyond the first segment except the distal margin of the second, third and fourth segments, all ferruginous; head anterior to insertion of antennae, thorax except as above, first abdominal segment, distal margin of first and second tergite, and legs, all black; mandibles not emarginate nor toothed beneath; clypeus transversely concave, the elevated posterior margin arcuate; first segment of flagellum conspicuously longer than the second, the whole of the first segment and proximal half of the second, strongly compressed; median, glabrous area of last tergite terminating in the arms of a strongly elevated Y-shaped carina; sixth sternite with a pair of distinct, lateral tubercles; seventh sternite with a pair of prominent, cariniform, lateral tubercles; hypopygium with a pair of distinct, oblique carinae on the proximal half; wings fuliginous. Length, 14 mm.

Head ferruginous, except anterior to the antennal tubercles, the caudal aspect of the head medially, and proximal half and extreme tips of mandibles, all black; head clothed with long, erect, sparse, black hairs and very short, sparse, inconspicuous, pale pubescence; mandibles edentate at the apex and with a distinct tooth within near the apex, the dorsal aspect with a high,

sharp, prominent, longitudinal carina, not at all emarginate nor toothed beneath; median, glabrous area of clypeus slightly but distinctly, transversely concave, the elevated posterior margin evenly arcuate; scape clothed with sparse, black hairs, not conspicuously broadened distally, nor with a brush of pubescence beneath, bicarinate beneath but the two carinae approximate and not distinct; first segment of flagellum as well as the proximal half of the second strongly compressed and broadened, the flattened surface beneath with very short, thick, silky, pale pubescence; first segment of flagellum distinctly longer than the second; antennal scrobes distinctly carinate above; front, vertex and genae with moderate, dense, more or less confluent punctures throughout; ocelli small, the distance between the eye margins and the lateral ocelli equal to approximately three times the greatest diameter of the latter; relative widths of head and thorax at the tegulae, 5.0:6.8.

Thorax black, except the pronotum and most of propleura, an obscure spot at the median, anterior margin of the mesopleura, the mesonotum entirely, and the scutellum except the posterior margin, all ferruginous; thorax clothed with sparse, erect, long, blackish hairs, the dorsal areas also with short, sparse, obscure ferruginous pubescence; pronotum, mesonotum and scutellum with moderately large, dense, confluent punctures throughout; parapsidal furrows distinct, deeper posteriorly than anteriorly; scutellum strongly convex; enclosed area of dorsum of propodeum deep, narrow, elongate, subtriangular, the sides more or less sinuate, the apex slightly but distinctly elevated into a tubercle; dorsum and posterior face of propodeum otherwise strongly, deeply reticulate; propleura obscurely, confluent punctate, the broad posterior margin glabrous, micropunctate; ventral and dorsal areas of mesopleura separated by a deep, transverse furrow, with large, dense, confluent punctures; mesosternal tubercles well developed, oblique; metapleura glabrous, micropunctate, except for large, close punctures ventrally; sides of propodeum reticulate posteriorly, becoming shallowly reticulate medially and glabrous, micropunctate anteriorly; tegulae dark ferruginous, large, convex, glabrous, impunctate, except the anterior and inner margins punctate and black pubescent.

Abdomen ferruginous, except the first segment entirely, and broad, distal margins of the second, third and fourth both above and below, black; first sternite with sparse, long, pale hairs;

second sternite except distal margin with long, sparse, pale ferruginous hairs; second tergite except narrow anterior margin and broad posterior margin with sparse, long, erect, and sparse, short, subappressed, pale ferruginous pubescence; remainder of abdomen with sparse, erect, black pubescence, thicker at the distal margins of the second, third and fourth tergites; first tergite with large, distinct punctures becoming smaller and closer posteriorly; second tergite with moderate, distinct punctures becoming close and adjacent laterally, small and close at the posterior margin; tergites three to six with moderately small, distinct punctures; median, glabrous area of last tergite with a median, elongate, depressed area posteriorly and terminating in the arms of a very strongly elevated Y-shaped carina, the arms of the Y much more strongly elevated than the stem and almost as long as the stem; first sternite with a median, longitudinal carina on the anterior three-fourths; second sternite with moderately large, distinct punctures; sternites three to six with moderately small, distinct punctures towards the distal margin; fifth sternite without lateral tubercles; sixth sternite with a pair of distinct lateral tubercles; seventh sternite with a pair of prominent, cariniform, lateral tubercles; hypopygium with a pair of distinct, oblique carinae on the proximal half.

Wings fuliginous throughout; cell 2nd $R_1 + R_2$ obscurely truncate at the apex; cell R_5 receiving vein M_{3+4} slightly beyond the middle; cell R_4 present but somewhat less distinct than R_5 and receiving vein M_2 at almost four-fifths the distance from the base to apex.

Legs entirely black, sparsely clothed with fuscous to black pubescence; intermediate coxae with a distinct tubercle at the inner, posterior margin; calcaria pale.

Holotype.—Male, Cat. No. 50951, U. S. National Museum, Johnson's Bayou, Louisiana, August 24, 1906 (J. D. Mitchell).

Paratypes.—

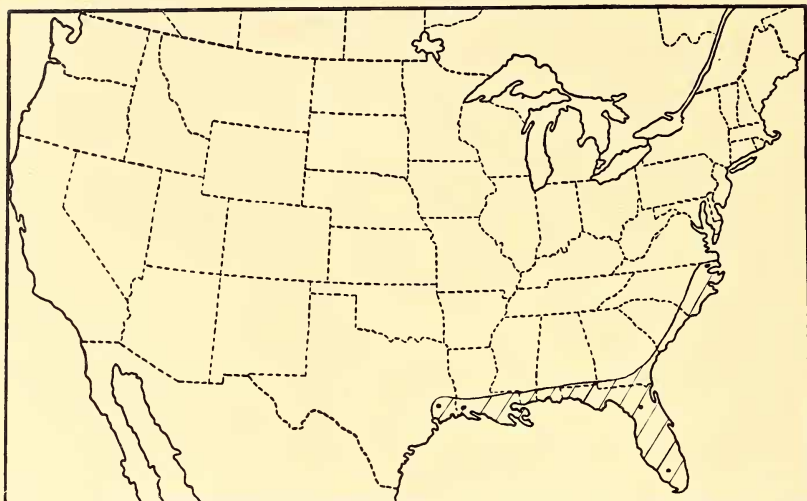
NORTH CAROLINA: male, South Mills, September 16, 1931 (Bradley and Knorr).

FLORIDA: male, Gainesville, July 13, 1918 (P. W. Fattig); two males, 10–40 miles east of Everglades, August 30, 1931 (Bradley and Knorr); male.

TEXAS: male.

Without data: male.

Related to *barbigera* subsp. *barbigera* Bradley which it closely



Distribution of *Timulla (Timulla) compressicornis* n. sp.

resembles. It differs from Bradley's species in the strongly compressed first and second flagellar segments, less concave median area of clypeus, absence of pubescent brush on scape beneath, more coarsely reticulate propodeum, and the more highly elevated Y-shaped carina of the last abdominal tergite. The paratype from Texas has the head and pronotum heavily infuscated so that they appear blackish, only the vertex and large humeral areas of the pronotum appearing distinctly ferruginous. The paratypes vary in length from 12 to 19 mm. This may be the male sex of *euterpe* Blake.

Timulla (Timulla) euterpe (Blake). (New combination)

- 1879. *Mutilla Euterpe* Blake, Trans. Amer. Ent. Soc., vii, p. 249, female.
- 1886. *Mutilla euterpe* Blake, Trans. Amer. Ent. Soc., xiii, p. 201, female.
- 1897. *Mutilla euterpe*, Dalla Torre, Cat. Hymen., viii, p. 38, female.
- 1899. *Mutilla euterpe* Fox, Trans. Amer. Ent. Soc., xxv, p. 272, female.
- 1903. *Mutilla euterpe* André, Gen. Ins., i, fasc. 11, p. 42, female.
- 1916. *Mutilla (Timulla) euterpe* Bradley, Trans. Amer. Ent. Soc., xlii, p. 210, female.

1923. *Timulla euterpe* Mickel, 19th Rept. State Ent. Minnesota, p. 111, female.

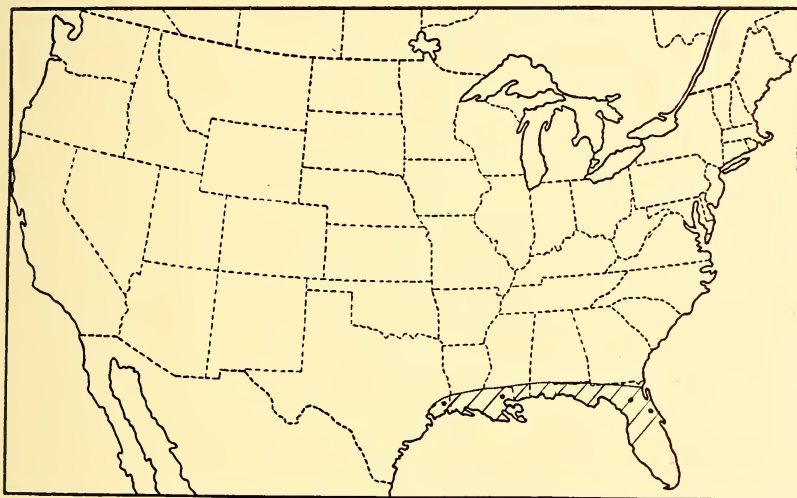
Type.—Female, Enterprise, Florida, May, in collection of American Entomological Society, Philadelphia.

Specimens examined.—

FLORIDA: female, Gainesville, May 16, 1926 (M. D. Leonard); female, Bell Glade, July, 1926 (M. D. Leonard).

LOUISIANA: three females, New Orleans.

TEXAS: female, Beaumont, July 1-5, 1918 (E. L. Diven).



Distribution of *Timulla (Timulla) euterpe* (Blake)

I have previously (1923) recorded a specimen of this species from Hennepin County, Minnesota, although expressing doubt as to the correctness of the locality label. I have now examined seven other specimens in addition to the holotype, all of which are from the Gulf Coast. I believe now that the alleged Minnesota specimen bears an incorrect locality label and that it should not be considered as a Minnesota species. *Euterpe* appears to be allied to *barbigera* subsp. *barbigera* although this is not obvious on account of the color pattern of the abdomen. The thoraces of the two species are very similar, both being strongly constricted medially and both lacking a scutellar scale. Both species also have the median, longitudinal carina of the first sternite strongly elevated anteriorly. If these two species are related, as seems probable, then the male of *euterpe*

may be *compressicornis* which has a similar geographic distribution to *euterge*.

Timulla (Timulla) euphrosyne n. sp.

Female.—Ferruginous, except the antennae, first abdominal segment, posterior third of second tergite, broad distal margin of second sternite, third abdominal segment entirely, and legs, all black, the fourth abdominal sternite dusky; lateral margins of thorax shallowly but distinctly emarginate medially; scutellar scale entirely absent; abdomen without pale pubescent markings except the second tergite with a narrow, distal band of thick, pale pubescence narrowly, conspicuously, angularly dilated anteriorly at the middle; pygidial area faintly granulate throughout and faintly longitudinally rugose anteriorly. Length, 9 mm.

Head ferruginous, except the antennae and tips of mandibles black, clothed throughout with sparse, erect and recumbent, ferruginous pubescence; mandibles edentate at the apex and with a small tooth within near the tip; clypeus elevated posteriorly the elevated margin arcuate and with four evenly spaced, low, blunt teeth; scape with close, fine punctures above; first segment of flagellum approximately equal in length to the second and third segments united; antennal scrobes distinctly carinate above; front and vertex with moderate, dense, confluent punctures, the latter denser anteriorly on the front than posteriorly on the vertex; genae with moderate, shallow, separated punctures interspersed with fine punctures; relative widths of head and thorax, 3.5:3.2.

Thorax entirely ferruginous, the dorsum clothed with sparse, erect, ferruginous pubescence, the pleural areas with pale micropubescence; humeral angles not prominent; lateral margins of dorsum of thorax distinctly emarginate medially; relative widths of thorax at humeral angles, immediately posterior to anterior spiracles, at propodeal spiracles, and greatest width of propodeum, 3.2, 2.8, 2.9, 3.1, respectively; dorsum of thorax with moderately large, dense, confluent punctures becoming reticulate and asperated on the posterior face of propodeum; scutellar scale absent; propleura with moderate, obscure punctures; sides of propodeum with moderate punctures posteriorly; remainder of pleural areas micropunctate and micropubescent.

Abdomen ferruginous, except the first segment entirely, distal third of second tergite, broad distal margin of second sternite

and third abdominal segment entirely, all black; first tergite with fine, close, shallow punctures throughout, clothed with sparse, erect, pale pubescence, except the distal fringe black; second tergite with fine and very small punctures intermixed throughout, clothed with sparse, ferruginous pubescence, except medially with sparse, black pubescence, the black distal third with black pubescence, and the distal margin with a narrow band of pale pubescence angularly dilated at the anterior middle; third tergite with very small, close punctures, clothed with sparse, fuscous to black pubescence except laterally with some pale pubescence; tergites four and five with fine, close punctures and sparse, ferruginous pubescence; pygidial tergite clothed with ferruginous pubescence, the pygidial area faintly granulate throughout and faintly, longitudinally rugose anteriorly; first sternite with a median, longitudinal carina somewhat elevated anteriorly; second sternite with scattered moderate punctures, except the posterior margin with very small, close punctures, clothed with sparse, pale pubescence and a thin distal fringe of pale pubescence; sternites three to five with fine and moderately small punctures intermixed at their distal margins and each with a thin, distal fringe of pale pubescence.

Legs entirely black, sparsely clothed with pale pubescence, the spines of the tibiae dark ferruginous; calcaria pale ferruginous.

Holotype.—Female, Cat. No. 50953 U. S. National Museum, High Island, Texas, May 29, 1918 (E. L. Diven).

Paratypes.—Female, Galveston, Texas, May (F. H. Snow); female, Dunedin, Florida, March 24, 1914 (W. S. Blatchley).

Very similar in appearance to *euterpe* Blake on account of the three ferruginous terminal, abdominal segments, the black third abdominal segment and the similarity of the markings on the second segment. It also resembles *euterpe* in lacking a scutellar scale. This species can be easily separated from *euterpe* by the less deeply emarginate latero-dorsal margins of the thorax and the much finer, closer punctuation of the second tergite.

Timulla (*Timulla*) *vagans* subsp. *vagans* (Fabricius). (New combination)

1798. *Mutilla vagans* Fabricius, Suppl. Entom. Syst., p. 282, female.

1804. *Mutilla vagans* Fabricius, Syst. Piezatorum, p. 439, female.

1811. *Mutilla vagans* Olivier, Encycl. méthod. Insect. p. 66, female.
1836. *Mutilla hexagona* Say, Bost. Journ. Nat. Hist., i. p. 295, male. (New synonymy.)
1859. *Mutilla hexagona* Leconte, Writ. of Th. Say, Entom., ii, p. 738, male.
1865. *Mutilla hexagona* Cresson, Proc. Entom. Soc. Phila., iv, p. 430, male.
1865. *Mutilla ornativentris* Cresson, Proc. Ent. Soc. Phila., iv, p. 438, female. (New synonymy.)
1871. *Mutilla Briaxus* Blake, Trans. Amer. Ent. Soc., iii, p. 277, male. (New synonymy.)
1871. *Mutilla hexagona* Blake, Trans. Amer. Ent. Soc., iii, p. 228, male (in part).
1871. *Mutilla ornativentris* Blake, Trans. Amer. Ent. Soc. iii, p. 230, female.
1871. *Mutilla vagans* Blake, Trans. Amer. Ent. Soc., iii, p. 257, female.
1885. *Mutilla Briaxus* Radoskowski, Horae soc. ent. Rossicae, xix, p. 14, T. 2, f. 10, male.
1886. *Mutilla hexagona* Blake, Trans, Amer. Ent. Soc., xiii, p. 195, male (in part).
1886. *Mutilla hexagona* var. *briaxus* Blake, Trans. Amer. Ent. Soc., xiii, p. 195, male.
- 1886, *Mutilla ornativentris* Blake, Trans. Amer. Ent. Soc., xiii, pp. 196-197, female.
1886. *Mutilla vagans* Blake, Trans. Amer. Ent. Soc., xiii, p. 280, female.
1887. *Mutilla canadensis* Provancher, Add. et Corrections au vol. 2 de la Faune Entom. du Canada, Trait des hymén, p. 250, male. (New synonymy.)
1897. *Mutilla hexagona* var. *briaxus* Dalla Torre, Cat. Hymen., viii, p. 47, male.
1897. *Mutilla ornativentris* Dalla Torre, Cat. Hymen., vii, p. 69, female.
1897. *Mutilla secunda* Dalla Torre, Cat. Hymen., viii, p. 84, male. (New synonymy.)
1897. *Mutilla vagans* Dalla Torre, Cat. Hymen., viii, p. 95, female.
1899. *Mutilla hexagona* Fox, Trans. Amer. Ent. Soc., xxv, p. 270, male (in part).

1899. *Mutilla dubitata* Fox, Trans. Amer. Ent. Soc., xxv, pp. 270-271, female (in part).
1900. *Mutilla hexagona* Ashmead, in John B. Smith's Catalogue of the Insects of New Jersey, p. 535, male (in part).
1900. *Mutilla ornativentris* Ashmead, in John B. Smith's Catalogue of the Insects of New Jersey, p. 535, female (in part).
1903. *Mutilla hexagona* var. *briaxus* André, Gen. Ins., i, fasc. 11, p. 42, male.
1903. *Mutilla secunda* André, Gen. Ins., i, fasc. 11, p. 74, male.
1903. *Mutilla vagans* André, Gen. Ins., i, fasc. 11, p. 74, female.
1903. *Mutilla hexagona* Melander, Trans. Amer. Ent. Soc., xxix, p. 323, male (in part).
1903. *Mutilla dubitata* Melander, Trans. Amer. Ent. Soc., xxix, p. 323, female (in part).
1909. *Mutilla* (*Timulla*) *briaxus* Rohwer, Trans. Amer. Ent. Soc., xxxv, p. 132-133, male (not female).
1910. *Timulla hexagona* Viereck, in John B. Smith's, The Insects of New Jersey, p. 665, male (in part).
1910. *Timulla ornativentris* Viereck, in John B. Smith's, The Insects of New Jersey, p. 665, female (in part).
1916. *Mutilla* (*Timulla*) *briaxus* Bradley, Trans. Amer. Ent. Soc., xlii, p. 207-208, male and female.
1923. *Timulla briaxus* Mickel, 19th Report of State Entomologist of Minnesota, 1922, p. 111, male and female.
1928. *Mutilla* (*Timulla*) *briaxus* Bradley, in Leonard's, A List of the Insects of New York, Mem. 101, Cornell Uni. Agri, Exp. Sta., p. 994, male and female.

Type.—Female, Boreal America, in Zoologisk Museum, Copenhagen, Denmark. Types of *ornativentris* Cresson and *briaxus* Blake in collection of American Entomological Society, Philadelphia. Type of *canadensis* Provancher, yellow label, 1409, in Provancher collection, Public Museum, Quebec, Canada.

All of the above type specimens have been examined with the result that *vagans* and *ornativentris* were found to be identical; and *briaxus* and *canadensis* were found to be the same as had been suggested by Bradley (1916). Ten instances (*i.e.*, the specimens) are before me of males and females taken in copula; in all cases the fe-

male is the same as *vagans* Fabricius and the male is the same as *briaxus* Blake. Fabricius' name of course has priority. The female assigned to *briaxus* by Rohwer (1909) is a different species (*cf. dubitiformis* n. sp.) and not the same as the females which are invariably taken in copula with the male of *vagans*. Say's type of *hexagona* is apparently lost but there can be little doubt that it is the same as the male of *vagans*; the latter is the only male *Timulla* occurring in Indiana and Missouri that agrees with Say's description.

Specimens examined.—

CANADA: Ontario: two males, Toronto, July 12, 1891; three males, Toronto, July 17, 1891; two females, Toronto, August 1, 1893; male, Toronto, August 2, 1891; male, Toronto, August 5, 1888; female, Grimsby, July 31, 1894; male, July 21–31 (C. H. Kennedy).

CANADA: four males, two females.

VERMONT: female, Fairlee (C. M. Weed); female, Winooski, August 20, 1901.

MASSACHUSETTS: two males, Woods Hole, August, 1922 (E. G. Anderson); male and female (in copula), Woods Hole, July 11, 1919 (W. T. M. Forbes); female, Southhampton, August 1, 1896; female, Nantucket, August 18, 1926 (C. W. Johnson); female, Nantucket, September 18, 1933 (J. M. Valentine); female, Springfield (Geo. Dimmock); female, West Springfield, September 10, 1915 (H. E. Smith).

CONNECTICUT: male, Lyme, July 4, 1911 (Kirk and Champlain); male, Lyme, July 22, 1918 (W. S. Fisher); two males, Lyme, July 23, 1918 (W. S. Fisher); female, Lyme, August 26, 1909 (A. Champlain); two males, Waterbury, August 10, 1932; two males, Black Point, July 28, 1896; two males, Hartford, July 30, 1893; female, Hartford, August 7, 1892; male, Hartford, August 16, 1893; female, Hartford, September 4, 1899; female, Hartford, September 15, 1896; female, East Hartford, August 29, 1904 (H. L. Viereck); female, New Canaan, September 10, 1908 (H. B. Walden); female, Yalesville, September 24, 1912 (H. B. Kirk); female, New Haven, July 26, 1904 (H. L. Viereck); female, New Haven, July 28, 1932; male, East Haven, July 25, 1923 (J. L. Rogers).

NEW YORK: female, Cold Spring Harbor, Long Island, June 24, 1921 (E. G. Anderson); two females, Cold Spring Harbor, Long Island, June 27, 1921 (S. H. Emerson); male and female, Cold Spring Harbor, Long Island, July 8, 1921 (E. G. Anderson); two females, Cold Spring Harbor, Long Island, July 9, 1921 (E. G.

Anderson); female, Cold Spring Harbor, Long Island, July 28, 1921 (John Rowman); male, Cold Spring Harbor, Long Island, July 29, 1921 (S. H. Emerson); female, Cold Spring Harbor, Long Island, August 4, 1921 (John Rowman); female, Cold Spring Harbor, Long Island, August 9, 1921 (E. G. Anderson); female, Riverhead, Long Island, May 30, 1933 (Roy Latham); female, Riverhead, Long Island, July 1, 1933 (Roy Latham); two females, Calverton, Long Island, June 19, 1932 (Roy Latham); female, Jessup Creek, Long Island, September 8, 1932 (Roy Latham); female, Sag Harbor, Long Island, May 6, 1932 (Roy Latham); female, Mattituck, Long Island, August 1, 1926 (Roy Latham); female, Greenport, Long Island, September 3, 1933 (J. M. Valentine); female, Long Island; female, Crown Point, August; male, Ithaca, August, 1917 (E. G. Anderson); female, Ithaca, July 18, 1918 (E. G. Anderson); female, Ithaca, July 20, 1919; male, Ithaca, July 20, 1934; male, Ithaca, July 30, 1902; female, Ithaca, August 12, 1929 (H. Rahn); male, Taughanick Falls, August 3, 1931 (P. P. Babi); male, Rochester Jr., July 14, 1911 (M. D. Leonard); female, Olcott, July 18, 1921 (H. Dietrich); female, Olcott, August 1, 1921 (H. Dietrich); female, Olcott, August 5, 1921 (H. Dietrich); female, Olcott, August 20, 1921 (H. Dietrich); female, Lockport, August 22, 1934 (L. L. Pechuman); male and female.

PENNSYLVANIA: male, Pike County, July, 1910; female, Philadelphia, August 16 (Carl Ilg); two males, Chestertown, August 4, 1902; male, Chambersburg, July 12, 1922 (Craighead and Stear); female and male, Chambersburg, July 18, 1922 (Craighead and Stear); male, Columbia, July 14, 1908 (P. R. Myers); female, Harrisburg, August 8, 1909 (P. R. Myers); female, Rockville, August 15, 1915; female, Kennett Square, July 2, 1918; female, Leigh Gap, July 23, 1903 (J. C. Bradley); female, Inglenook, July 20, 1911 (W. S. Fisher); male, two females.

DELAWARE: male and female.

NEW JERSEY: female and male, Fords, July 20, 1909 (W. T. Davis); female, Whitesville, July 13, 1911 (W. T. Davis); two females, Westville, August 30; female, Browntown, August 21, 1909 (W. T. Davis); male, Camden County, July 26, 1891; female, Camden County, July 27, 1890; four females, Camden County; three males, Gloucester County, July 15; male, Gloucester County, July 5, 1891; male, Malaga, August 4, 1907 (G. M. Greene); male, Merchantville, July 15; male, Riverton, July 5, 1901; female, Riverton, September 11; male, Moorestown, August 6, 1927; male, Monmouth County, July 6, 1891; female, Weymouth, July 25, 1923; female,

Cape May County, August, 1910 (W. T. Davis); female, August 31, 1890; two females.

MARYLAND: females, Chestertown, August 2, 1901; male, Chestertown, August 12, 1901; male, Poolesville, July, 1898; female, Baltimore, August, 1839; male, Beltsville, July 30, 1916 (Harold Morrison); two males, Riverdale, August 2, 1902; male, Camp Meade, May, 1919 (R. C. Shannon); male, Chautauqua (Chittenden).

DISTRICT OF COLUMBIA: female, Washington, July 20, 1929; two females, Washington, September, 1906; female, August, 1878; male, Washington, July 23, 1902; female, two males.

VIRGINIA: female, Great Falls, August 6, 1923; female, Rosslyn; male, nine females, Clifton, July 1-9, 1933 (J. C. Bridwell); male, two females, Clifton, July 15-23, 1933 (J. C. Bridwell); male, three females, Clifton, July, 1933 (J. C. Bridwell); female, Clifton, August 6, 1932 (J. C. Bridwell); male, two females, Clifton, August 20, 1933 (J. C. Bridwell); female, Barcroft, September 17, 1933 (J. C. Bridwell); male, Barcroft, September, 1926 (J. C. Bridwell); female, Falls Church, July 21, 1922 (R. A. Cushman); female, Falls Church, August 4, 1913 (H. B. Kirk); female, Falls Church, August 26, 1916 (G. M. Greene); female, Falls Church, September 4, 1915 (C. T. Greene); female, Glencarlyn, July 26 (N. Banks); female, Accotink, August 26 (H. S. Barber); female, Nelson County, June 26, 1914 (W. Robinson); female, Nelson County, July 10, 1925 (W. Robinson); female, Wingina (Wm. T. Davis); female, August 4, 1880; female, August 9, 1888; female, July 19; male.

NORTH CAROLINA: two females, Durham, August, 1902 (F. Sherman); male, Kittrell, July 2, 1906 (R. S. Woglum); male, Asheville, August 12, 1903 (S. W. Foster); male, Homestead, August 19, 1903 (S. W. Foster); female, Southern Pines, August 12, 1904 (G. M. Bentley).

SOUTH CAROLINA: male, Clemson College, June 28, 1927 (D. Dunavan); female (Zimmerman).

GEORGIA: male, female, Monticello (E. G. Titus); female, Prattsburg, July 25, 1930 (R. H. Beamer); female, Atlanta, July 20, 1934 (P. W. Fattig); female, Atlanta, August 11, 1934 (P. W. Fattig); female, Atlanta, August 19, 1934 (P. W. Fattig); female, Atlanta, August 25, 1933 (P. W. Fattig); two females, Atlanta, August 26, 1932 (P. W. Fattig); female, Atlanta, September 23, 1934 (P. W. Fattig); female, Stone Mountain, August 3, 1913; female, Yonah Mt., July 28, 1934 (P. W. Fattig); three females, Griffin, September, 1902; female.

TENNESSEE: male, Chattanooga, July 4, 1922 (T. H. Hubbell); three males, Cumberland County, July 8, 1922 (T. H. Hubbell); male, Cumberland County, July 15, 1922 (T. H. Hubbell); female, Fentress County, August 15, 1922 (T. H. Hubbell); male, Fentress County, August 20, 1922 (T. H. Hubbell); female, Fentress County, August 23, 1922 (T. H. Hubbell); male, Knoxville, July 14, 1920; male, Knoxville, July 19, 1923 (Geo. G. Ainslie); female, Knoxville; two females, Knox County (Geo. G. Ainslie); two females, Nashville, August 3, 1915 (Geo. G. Ainslie); female, Townshend, July 14, 1909; female, 1922 (Gill).

KENTUCKY: male, female.

WEST VIRGINIA: female, Harper's Ferry, September 2, 1922 (H. S. Barber).

OHIO: four males, Hocking County, August (C. H. Kennedy); two males, Put-in-Bay, July 8, 1922; male, Highland County, August 9, 1926 (C. H. Kennedy); male, Lawrence County, August 23, 1926 (C. H. Kennedy); male, Cedar Point, July 8, 1918 (O. Gosard); female, Wauseon, August 5, 1896; female, Sandusky, August 8, 1924; female, Sandusky, August 10, 1924; female, Amherst, July, 1934 (H. J. Reinhard); male, Carbondale, July 27, 1932 (W. C. Stehr); male, Jug Run, Smithfield, August 4, 1927 (C. H. Kennedy); male, Amherst, July, 1933 (H. J. Reinhard); female, Athens, July 17, 1932 (W. C. Stehr); two females, Athens, July 23, 1932 (W. C. Stehr); female, Athens, July 29, 1932 (W. C. Stehr); female, Athens, July 31, 1932 (W. C. Stehr).

MICHIGAN: two females, Jackson, July 22, 1925 (W. M. McComb and C. E. Matson); female, Jackson, July 24, 1925 (C. E. Matson); female, Jackson, July 27, 1925 (C. E. Matson); female, Jackson, July 28, 1925 (C. E. Matson); female, Jackson, August 5, 1925 (E. G. Anderson); two females, Jackson, August 12, 1925 (C. E. Matson); five females, Ann Arbor, July 16, 1925 (E. G. Anderson); female, Ann Arbor, August 14, 1925 (E. G. Anderson); three females, Ann Arbor, September 21, 1925 (E. G. Anderson); female, Dexter, July 3, 1923 (E. G. Anderson); fourteen males, Dexter, July 18, 1923 (E. G. Anderson); twenty-five males, Dexter, July 19, 1923 (E. G. Anderson); female, Dexter, July 27, 1924 (E. G. Anderson); fourteen females, Dexter, September 14, 1924 (E. G. Anderson); eleven females, Dexter, September 16, 1924 (E. G. Anderson); four females, Dexter, September 18, 1924 (E. G. Anderson); sixteen females, Dexter, September 19, 1924 (E. G. Anderson); three females, Dexter, September 23, 1924 (E. G. Anderson); female, Eloise, Wayne County, August 18, 1912 (F. E. McCain);

female, South Haven, September 15, 1914; male and female, Breesville (Nettie Fuller); female, Agricultural College, August 17, 1920 (L. J. Botimer); female, Agricultural College, August 11, 1887; three males, four females.

INDIANA: male, Bloomington, July 8, 1923 (E. G. Anderson); male and female, Bloomington, July 9, 1923 (E. G. Anderson); four males, Borden, July 16-18, 1913 (Harold Morrison); five males, Corydon, July 20, 1913 (Harold Morrison); three males, Brown County, Indiana, August 2, 1913 (Harold Morrison); male, Wawasee, July 18, 1912 (Harold Morrison); female, Hebron, July 17, 1925 (E. G. Anderson); male and female, Harrison County, July 21, 1911; two males, female, Posey County, July 22-30, 1927; male, Posey County, July 31, 1927; male, Noblesville, July 4, 1913 (Harold Morrison); male, Noblesville, July 4, 1914 (Harold Morrison); male, Noblesville, July 25, 1915; female, Marion County, June 30, 1910 (Harold Morrison); female, Mineral Springs, July 29, 1923 (Owen Bryant); female, Elkton City, July, 1895; female, Vincennes, August 16, 1924.

ILLINOIS: male, Urbana, July 15, 1915; female, Farina, August, 1917 (H. Andrews).

MISSOURI: male, St. Louis, July 26, 1922 (P. Rau); female, St. Louis, August, 1877; female, St. Louis, August 8, 1922 (P. Rau); female, St. Louis (P. Rau); female, Jefferson City, September 16, 1925 (A. C. Burrill); female, Kansas City, July 10 (F. Rogers).

MISSISSIPPI: male, Ocean Springs, June, 1910 (F. F. Bibby); male, Agricultural College, August 2, 1913 (J. G. Hester); male, Lakeview, July 16, 1914 (J. C. Bradley).

LOUISIANA: female, Tallulah, July 15, 1925; two males, female, July 18, 1925; female, Tallulah, July 21, 1925; female, Tallulah, July 24, 1925; female, Tallulah; female, Tallulah, June 8, 1922 (R. C. Daney); male.

ARKANSAS: female, Ridgeway, August 13, 1884; female, Imboden, July 9, 1925 (Byron C. Marshall); female, Imboden (Byron C. Marshall).

WISCONSIN: female.

IOWA: two females, Iowa City, August 4, 1896; two females, Iowa City (Wiekham); male and female (in copula), Ames, July 26, 1931 (H. A. Scullen); female, Sargents Bluff, July 7, 1931 (C. N. Ainslie); three males, three females, Sargents Bluff, July 8, 1933 (C. N. Ainslie); female, Sargents Bluff, July 9, 1931 (C. N. Ainslie); four males, five females, Sargents Bluff, July 25, 1933 (C. N. Ainslie); female, Sargents Bluff, July 28, 1930 (C. N. Ains-

lie); four females, two males, Sargents Bluff, August 3, 1933 (C. N. Ainslie); male, Sioux City, July 7, 1931 (C. N. Ainslie); male and female (in copula), Sioux City, July 10, 1917 (C. N. Ainslie); female, Sioux City, July 11, 1931 (C. N. Ainslie); female, Sioux City, July 12, 1933 (C. N. Ainslie); female, Sioux City, July 13, 1929 (C. N. Ainslie); female, Sioux City, July 13, 1931 (C. N. Ainslie); two males, Sioux City, July 17, 1931 (C. N. Ainslie); female, Sioux City, July 20, 1928 (C. N. Ainslie); female, Sioux City, July 20, 1933 (C. N. Ainslie); female, Sioux City, July 22, 1932 (C. N. Ainslie); female, two males, Sioux City, July 24, 1931 (C. N. Ainslie); female, Sioux City, July 24, 1933 (C. N. Ainslie); female, Sioux City, July 25, 1931 (C. N. Ainslie); female, Sioux City, July 26, 1928 (C. N. Ainslie); female, Sioux City, July 28, 1931 (C. N. Ainslie); male, Sioux City, August 4, 1923 (C. N. Ainslie); female, Sioux City, August 19, 1932 (C. E. Mickel); female, Sioux City, August 25, 1928 (C. N. Ainslie); female, Sioux City, September 1, 1923 (C. N. Ainslie); female, Sioux City, October 1, 1932 (C. N. Ainslie); female.

MINNESOTA: female and male (in copula), Lake City, August 14, 1918; male, Lake City, July 7, 1921 (A. A. Nichol); female, Newport, July 18, 1922 (A. A. Nichol); female, Newport, July 18, 1922 (C. E. Mickel); male, Minneapolis, June 27, 1921 (A. A. Nichol).

NORTH DAKOTA: male, Marmarth, July 4, 1918 (O. A. Stevens); twelve females, thirteen males, Medora, August 3, 1923 (O. A. Stevens).

SOUTH DAKOTA: fourteen males, Buffalo, July 31, 1924; two females, Buffalo, September 9, 1927 (H. C. Severin); female, Buffalo, August 17, 1926 (H. C. Severin); two males, Camp Crook, August 1, 1924; male, Hot Springs, July 7, 1924; female, Hot Springs, September 12, 1927 (H. C. Severin); male, Whitewood, July 23, 1924; male, Rapid City; female, Elk Point, August 15 (C. N. Ainslie); female, Smithville.

NEBRASKA: male, South Sioux City, July 26, 1912 (L. T. Williams); male, Omaha, July 11, 1914 (L. T. Williams); female, Omaha, July 14, 1914 (L. T. Williams); two males, Omaha, July 30, 1914 (L. T. Williams); female, Omaha, August 2, 1913 (L. T. Williams); male, Omaha, August 13, 1914 (L. T. Williams); two females, Plattsmouth, September 3, 1923 (C. B. Philip); female, Lincoln, July 28, 1920 (R. W. Dawson); female, Lincoln, August 24, 1916 (M. H. Swenk); female, Lincoln, September; female, West Point, June 24; male, West Point, June 26; male, West Point, June, 1887; male,

West Point, July, 1887; male, two females, Meadow Grove, July 18, 1929 (C. N. Ainslie); male, Holt County, July 19, 1920 (F. C. Pellet); male, Culbertson, July 3, 1911 (J. T. Zimmer); female, Benkelman, July, 1899 (L. Bruner); male, Imperial, July 1, 1911 (J. T. Zimmer); male, female, Wallace, July 2, 1933 (R. Roberts); five males, two females, Wallace, July 3, 1933 (R. Roberts); three males, female, Ogallala, June 24, 1913 (R. W. Dawson); female, Sutherland, June 20, 1932 (M. J. Oosthuizen); three males, Lodgepole, August 6, 1934 (H. A. Scullen); male, Bridgeport, July 11, 1917 (C. E. Mickel); female, Scottsbluffs, August 5, 1923 (Leonard Worley); female, Mitchell, July 11, 1916 (C. E. Mickel); male Mitchell, July 20, 1916 (C. E. Mickel); female, Mitchell, July 22, 1913 (L. M. Gates); female, Mitchell, July 25, 1916 (C. E. Mickel); female, Mitchell, August 16, 1915 (E. M. Partridge); male, two females, Harrison, August 9, 1908 (R. W. Dawson); male, Glen, August 16, 1900; male, Monroe Canyon, August 6, 1908 (R. W. Dawson); female, Monroe Canyon, August 27, 1912 (E. J. Taylor); female, Hat Creek, August 14, 1911 (F. H. Shoemaker); female, Hat Creek, August; female.

KANSAS: two females, Doniphan County, August 26, 1921 (W. J. Brown and Robt. Guentert); female, Lawrence, August (E. S. Tucker); female, Lawrence, July 22, 1922 (C. H. Curran); female, Baldwin, June 27, 1906 (J. C. Bridwell); male, Baldwin, July 14, 1906 (J. C. Bridwell); male, Baldwin, July 24, 1906 (J. C. Bridwell); male, female, Baldwin, August 26, 1906 (J. C. Bridwell); two males, Baldwin, July (J. C. Bridwell); female, Douglas County, July 16, 1919 (Wm. E. Hoffmann); female, Douglas County, July 20, 1920 (Wm. E. Hoffmann); male, Douglas County, July 20, 1922 (W. J. Brown); female, Douglas County, July 29, 1919 (Wm. E. Hoffmann); female, Douglas County, September 5, 1911 (F. X. Williams); female, Douglas County, September 24, 1923 (R. H. Beamer); male, Cherokee County (R. H. Beamer); two females, Ottawa, August 6, 1923; female, Wabaunsee County (Forrest Anderson); female, Manhattan, August 19, 1930 (F. H. Walker); female, Riley County, June 26 (G. A. Dean); male, Riley County, July 4 (Popenoe); male, Riley County, July 16 (Popenoe); female, Riley County, July 18 (G. A. Dean); female, Riley County, July 22 (C. W. Pape); female, Riley County, July 24 (G. A. Dean); two females, Riley County, July (Marlatt); female, Riley County, July (Popenoe); male, Riley County, August 7 (Marlatt); female, Riley County, August 7 (Popenoe); female, Riley County, August 8 (J. B. Norton); female, Riley County, August 20 (P. J. Parrott); male,

Riley County, August (Popenoe); female, Riley County, August (Marlatt); female, Riley County, September 6 (Popenoe); female, Riley County, September 12 (Popenoe); female, Riley County (Popenoe); female, Riley County (J. B. Norton); male, Riley County; three males, four females, Clay County, August, 1901 (J. C. Bridwell); male, female, Dickinson County (J. C. Bridwell); female, Republic County (R. H. Beamer); female, Wellington; female, Medora, August 28, 1925 (W. J. Brown); female, Haven, July (Searle); three females, central Kansas, August, 1898 (J. B. Norton); male, Ellsworth County, July 12, 1923 (L. C. Woodruff); male, Rice County, July 3, 1923 (R. H. Beamer); female, Onaga, July 13, 1925 (R. H. Beamer); male and female (in copula), Onaga, July 13, 1925 (R. H. Beamer); male and female (in copula), Onaga, July 12, 1920 (Crevecoeur); male, Onaga, July 15, 1920 (Crevecoeur); female, Onaga, July 15, 1927 (Crevecoeur); female, Onaga, July 16, 1929 (Crevecoeur); male, Onaga, July 18, 1925 (Crevecoeur); male and female (in copula), Onaga, July 26, 1924 (Crevecoeur); male, Onaga, August 5, 1922 (Crevecoeur); female, Onaga, August 13, 1923 (Crevecoeur); female, Onaga, September 17, 1926 (Crevecoeur); two females, Onaga, September 15, 1926 (Crevecoeur); female, Onaga, September 23, 1926 (Crevecoeur); male, Osborne County; male, Pratt County, June 27, 1911 (F. X. Williams); male, Kiowa County, July 6, 1911 (F. X. Williams); female, Kiowa County, July 14, 1923 (R. H. Beamer); female, Wellsville, July 23, 1901; two males, Norton County, July 5, 1925 (R. H. Beamer); female, Norton County, August 24, 1912 (F. X. Williams); female, Graham County, August 16, 1912 (F. X. Williams); male, Trego County, July 12, 1912 (F. X. Williams); female, Philipps County, August 30, 1912 (F. X. Williams); female, Ness County, July 5, 1912 (F. X. Williams); male, Dodge City, June 14 (Lantz); two males, four females, Meade County, July 10, 1911 (F. X. Williams); two females, Gray County, July 9-15, 1917; male, Gove County, July 1, 1885; male, Gove County (F. H. Snow); six males, female, Sheridan County (F. X. Williams); male and female (in copula), Sheridan County (F. X. Williams); six males, Decatur County (F. X. Williams); male, Rawlins County, July 4, 1925 (R. H. Beamer); male, Rawlins County (F. X. Williams); male, Thomas County (F. X. Williams); three females, Cheyenne County, July 5, 1925 (R. H. Beamer); male, Cheyenne County (F. X. Williams); female, Grainfield, September 23 (Lantz); fifteen females, Sherman County, August 1, 1925 (R. H. Beamer); male, female, Sherman County (F. X. Wil-

liams); male, Logan County (F. X. Williams); female, Wallace county, July 8; six males, Wallace County, July, 1885; two females, male, Wallace County (F. X. Williams); twenty-four males, Wallace County (F. H. Snow); male, female, Wichita County (F. X. Williams); six males, Scott County, June 17, 1925 (R. H. Beamer); male, Scott County, June 19, 1925 (Howard Deay); male, Scott County, June 22, 1925 (R. H. Beamer); male, Scott County, July 25, 1925 (R. H. Beamer); female, Hamilton County, August 27; female, Stanton County (S. J. Hunter); male, female, Grant County, July 23, 1911 (F. X. Williams); male, two females, Morton County, July 20, 1924 (C. O. Bare); female, Morton County, August 2, 1924 (C. O. Bare); female, Morton County, August 3, 1924 (C. O. Bare); four females, Morton County, August 5, 1911 (F. X. Williams); two males, Morton County (F. H. Snow); male and female (in copula), Kanorado, July 26, 1933 (Rodeck and James); five males, three females, western Kansas (Popenoe); two males, western Kansas (Williston); five males, two females.

OKLAHOMA: two males, female, Payne County, July 5, 1925 (W. J. Brown); female, Latimer County, June 20, 1931 (R. D. Bird); female, Latimer County, July 19, 1931 (W. Fisher); female, Latimer County, July 20, 1931 (W. Fisher); female, Latimer County, July 23, 1931 (W. Fisher); male, Pawnee County, July 20, 1932 (C. C. Deonier); male, Sequoyah County, July 27, 1931 (Costner and Davis); male, Sequoyah County, July 29, 1931 (Costner and Davis); male, Kenton, June 25, 1933 (A. E. Pritchard); male, Kenton, June 30, 1933 (W. Chiles); male, Hugo, June 20, 1934 (J. Stankavich); female, Okmulgee, July 25, 1931 (C. C. Deonier); female, Boise City, July 10, 1933 (W. Chiles); female, Boise City, July 9, 1933 (E. E. Ivy).

TEXAS: female, Willis, April, 1903 (J. C. Bridwell); male, two females, Willis, May, 1903 (J. C. Bridwell); female, Athens, June 4, 1906 (F. C. Bishopp); two females.

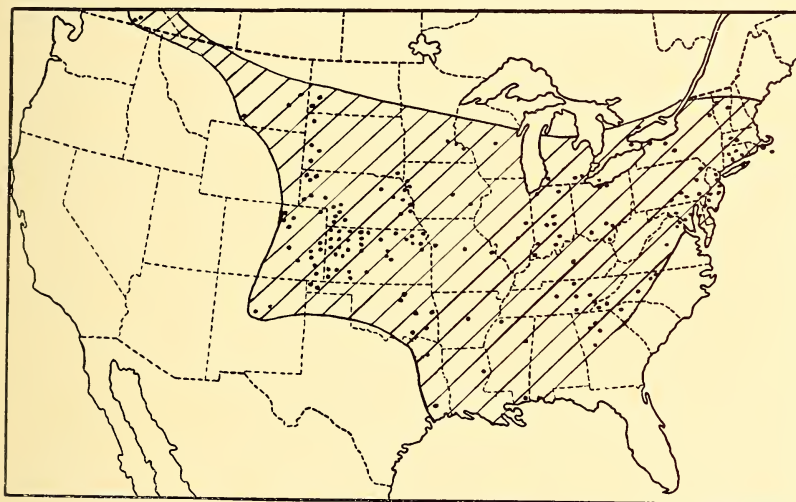
NEW MEXICO: male, Las Vegas, August 11 (Barber and Schwarz); five males, two females, Albuquerque; male, Albuquerque, June 27, 1931 (H. A. Scullen).

COLORADO: male, Julesburg, August 4, 1899; male, Lamar, July 6, 1932 (C. R. Jones); three males, Burlington, July 27, 1933 (Rodeck and James); male and female (in copula), Cheyenne Wells, August 9, 1929 (Klots); female, Sugar City, September 16, 1930 (H. Rodeck); male, Eads, July 29, 1933 (Rodeck and James); four females, Two Buttes, August 2, 1933 (Rodeck and James); male, Kit Carson, July 9, 1932 (C. R. Jones); female, Roggen, July 8,

1933 (M. and H. James) ; female, Colorado Springs, June 16, 1893 ; female, Denver, July 22, 1900 ; male and female, Boulder, July 24 (Cockerell) ; female, Boulder, July 15 (Cockerell) ; male, Boulder, July 10 (Cockerell) ; male, Boulder, July 25, 1932 (M. T. James) ; female, White Rocks, Boulder County, October 4, 1924 (Bethel Blake) ; thirteen males, Fountain Valley School, Colorado Springs, July 12-19, 1932 ; three females, two males, Fort Collins, July 12, 1900 ; male, Fort Collins, July 16, 1903 ; female, Fort Collins, September 27, 1931 ; thirteen males, six females.

MONTANA : male, Huntley, July 19, 1917 ; male, Huntley, July 23, 1917 ; ten males, Huntley, August 23, 1915 ; male, Miles City, August 27, 1915 ; female, Glendive, September, 1928 (C. N. Ainslie) ; eight males, female.

CANADA : British Columbia : male, female, Okanagan, August ; two males, Osoyoos.



Distribution of *Timulla* (*Timulla*) *vagans* subsp. *vagans* (Fabricius)

This is the most widely distributed and abundant species of the genus *Timulla* in North America north of Mexico. The female has been confused with *dubitata* Smith in collections. The female may be recognized at once by the following combination of characters: sides of thorax distinctly emarginate medially, second tergite with a pair of anterior, more or less distinct, pale pubescent spots, and a distinct mesonotal-scutellar suture or groove just anterior to the scutellar scale. The male can be distinguished by the brush of white

hairs on the scape beneath, the dark fuscous wings, and the sparse, black pubescence of the abdominal tergites. The females as well as the males vary a great deal in size; length of females varies from 6 to 14 mm.; the males from 9 to 19 mm.

Timulla (Timulla) vagans subsp. *rufinota* n. subsp.

Male.—Exactly like *vagans* except the pronotum and mesonotum entirely and the propodeum more or less, ferruginous. Length, 17 mm.

Female.—Indistinguishable from *vagans*. Length, 9 mm.

Holotype and allotype.—Male and female taken in copula, Cat. No. 51097 U. S. National Museum, Centreville, Florida, July 20.

Paratypes.—Female, Gainesville, Florida, March 7, 1922; male, Gainesville, Florida, May 4, 1928; male, Gainesville, Florida, May 16, 1928; male, Gainesville, Florida, August 11, 1918 (P. W. Fattig); male, Gainesville, Florida, August 14, 1918 (P. W. Fattig); male, Gainesville, Florida, September 28, 1918 (P. W. Fattig); female, Pomona, Putnam County, Florida, September 7–8, 1917 (Rehn and Hebard); female, Ocala, Marion County, Florida, September 19–20, 1917 (Rehn and Hebard); female, Lake Jackson, Leon County, Florida, June 22, 1922 (J. S. Alexander); male, Orlando, Florida, July 10, 1907 (Russell); male, Orange County, June 29, 1939 (B. O. Hiers, Jr.); female, Lutz, Florida, March 31, 1917 (Krautwurm); female, Dade City, Florida, May 13, 1910 (W. D. Hunter); male, Florida.

The ferruginous color of the thorax of the males appears to be the only difference which can be used to distinguish this Florida subspecies. External structural characteristics are the same in both the type form and the Florida subspecies. The genitalia have been examined and while there are subtle differences, the latter are not different in nature than those found in various individual males of the type subspecies. The extent of ferruginous color on the thorax may be confined to the pronotum and mesonotum, or the scutellum may be slightly ferruginous anteriorly, the propodeum more or less ferruginous laterally and the first abdominal segment almost entirely ferruginous. The females are the same as in the subspecies *vagans*.

Timulla (Timulla) grotei (Blake). (New combination)

1871. *Mutilla Grotei* Blake, Trans. Amer. Ent. Soc., iii, p. 228, male.

1874. *Mutilla fulviventris* Gerstaecker, Archiv. f. Naturg., xl, p. 323, male. (New synonymy.)

1886. *Mutilla Grotei* Blake, Trans. Amer. Ent. Soc. xiii, pp. 195–196, male.

1894. *Mutilla fulviventris* Cameron, Biol. Centr.-Amer., Hymen., ii, pp. 286-287, male.
1897. *Mutilla fulviventris* Dalla Torre, Cat. Hymen., viii, p. 42, male.
1897. *Mutilla grotei* Dalla Torre, Cat. Hymen., viii, p. 45, male.
1899. *Mutilla Grotei* Fox, Trans. Amer. Ent. Soc. xxv, p. 271, male.
1903. *Mutilla fulviventris* André, Gen. Ins., i, fasc. 11, p. 42, male.
1903. *Mutilla Grotei* André, Gen. Ins., i, fasc. 11, p. 42, male.
1903. *Mutilla Grotei* Melander, Trans. Amer. Ent. Soc. xxix, p. 323, male.
1916. *Mutilla (Timulla) grotei* Bradley, Trans. Amer. Ent. Soc., xlii, p. 207, male.

Type.—Male, Colorado, in collection of American Entomological Society, Philadelphia; holotype of *fulviventris* Gerstaecker in Zoological Museum der Universität, Berlin.

I have examined the holotype of both *grotei* and *fulviventris* and find them to be the same. My examination of the type of *grotei* has also been checked by Mr. E. T. Cresson, Jr., who was kind enough to compare additional specimens for me.

The two sexes have been taken together at Valentine, Texas, July 8, 1917 (H. H. Knight), the male carrying the female, and have also been taken at the same time and place in three other instances, once in Texas and twice in Utah. The female has heretofore been undescribed.

Female.—Head, scape, all the coxae, anterior femora, and thorax ferruginous; head slightly wider than the thorax; abdomen black with pale pubescent markings; scutellar scale broad and conspicuous; pygidial area longitudinally rugose on the proximal third, granulate on the distal two-thirds. Length, 10 mm.

Head ferruginous, sparsely clothed on the front and vertex with short fulvous hairs, on the genae and hind margin of the head with pale hairs; mandibles edentate, proximal half ferruginous, distal half black; posterior margin of clypeus elevated, the elevated margin crenulate; scape ferruginous, flagellum piceous; first segment of flagellum approximately equal in length to the second and third segments united; antennal scrobes very weakly carinate above; front, vertex and genae coarsely and densely punctate; genae not carinate posteriorly; relative widths of head and thorax, 4.7:4.5.

Thorax ferruginous, clothed with sparse, recumbent, fulvous hairs, that on the posterior face of propodeum pale and erect; humeral angles rounded; thorax distinctly narrowed medially; dorsum of thorax coarsely, deeply and densely punctate; posterior face of propodeum very deeply and densely reticulate, especially above; mesonotal-scutellar suture prominent; scutellar scale broad and conspicuous; pleura shining, impunctate, except the sides of the propodeum more or less coarsely punctate posteriorly; lateral margins of posterior face of propodeum denticulate.

Abdomen above black with pale pubescent markings; first tergite with scattered, large punctures, the distal margin with a band of pale pubescence; second tergite with large, coarse punctures throughout concealed by the black pubescence except at the sides, entirely black except the lateral margins pale pubescent, and the distal margin with a broad band of pale pubescence, the anterior margin of the latter sinuate, not straight; tergites three to five each with two quadrate spots of pale pubescence, those on tergite five almost touching at the distal margin, thus enclosing a cuneate spot of black pubescence on the median area of tergites three to five, the pale pubescent spots not extending to the lateral margins of the tergites; pygidium longitudinally rugose on the proximal third, granulate on the distal two-thirds; venter of abdomen very dark ferruginous; first sternite with a longitudinal carina; second sternite coarsely punctured, more sparsely so at the distal middle; sternites three to five closely, moderately punctate at the distal margin; sternites two to five with a thin distal fringe of pale pubescence.

All the coxae, anterior trochanters, and anterior femora except at the apex, ferruginous; remainder of anterior, middle and hind legs piceous, clothed with sparse, pale hairs; calcaria pale.

Allotype.—Female, Trenton, Utah, August 17, 1931 (W. L. Thomas), in University of Minnesota collection. A male was taken at the same time and place.

Specimens examined.—

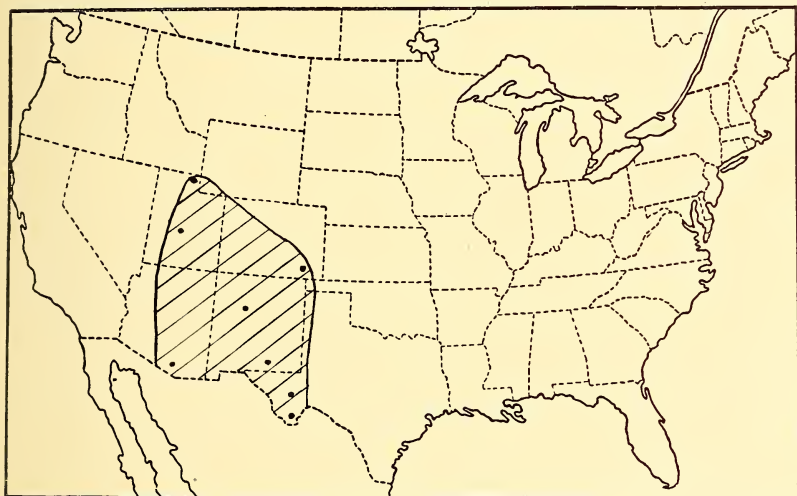
UTAH: female, Logan, July 31, 1925 (A. C. Burrill); female, Logan, August 28, 1925 (A. C. Burrill); female, Vineyard, September 4 (Tom Spalding); male and female, Richfield, August 17, 1904; male, Far West, September 15, 1932 (Lowell Cutler); male, Trenton, August 17, 1931 (W. L. Thomas).

ARIZONA: four males, Santa Rita Mts., July (F. H. Snow).

COLORADO: male, Tobe, August 4, 1933 (Rodeck and James).

NEW MEXICO: female, Jemez Springs, July 17, 1916 (John Woodgate); male, Jemez Springs, July 28, 1914; female, Jemez Springs, August 17, 1916 (John Woodgate); female, Dripping Springs, Organ Mts., August 19 (Cockerell).

TEXAS: three males, two females, Chisos Mts., Brewster County, June 10-12, 1908 (Mitchell and Cushman); female, Chisos Mts., September 7; male, Brewster County, June, 1929; three females, Cherry Canyon, Ft. Davis Quad, Davis Mts., June 29-July 1, 1916 (F. M. Gaige); male, Valentine, July 5, 1917; male and female taken together flying, Valentine, July 8, 1917 (H. H. Knight); female and four males, Limpia Canon, Davis Mts., July 7, 1917; male.



Distribution of *Timulla (Timulla) grotei* (Blake)

This species has a wide distribution in North America, but only a small part of its range lies within the United States. I have seen specimens of both sexes from southern Mexico and Guatemala which are exactly like specimens from Utah, Colorado, Arizona, New Mexico and Texas. The species is closely related to *vagans* Fabricius. The scape of the antennae of the male is perhaps even more flattened and dilated than in *vagans* and has a conspicuous pubescent brush beneath. The outstanding characters distinguishing the two species have been used in the key. The female is related to *suspensa* Gerstaecker but differs in having the second tergite entirely black pubes-

cent except the pale pubescent band at the distal margin. The form of the thorax and the sculpture of the pygidium is the same in both.

Timulla (Timulla) huntleyensis n. sp.

Male.—Head, thorax, first abdominal segment, disk of second abdominal sternite, and legs, all black; remainder of abdomen fulvous; mandibles strongly emarginate beneath and with a prominent tooth near the base beneath; scape conspicuously dilated and flattened distally, the distal half beneath with a dense brush of long, pale, glittering hairs; ocelli large, the distance between the eye margins and the lateral ocelli equal to twice the greatest diameter of the latter; last abdominal tergite with a median, elongate, glabrous area terminating in the arms of a strongly elevated Y-shaped carina, the stem of the Y slightly longer than the arms; mesosternal tubercles transverse; intermediate coxae with a conspicuous tooth on the inner, distal margin; wings fuliginous. Length, 18 mm.

Head entirely black, clothed with sparse, long, erect, fuscous pubescence intermixed with sparse, short, appressed, pale pubescence; mandibles edentate at the tip, with a distinct tooth within remote from the tip, the dorsal surface with a strong, conspicuous, longitudinal carina, strongly emarginate beneath, and with a prominent tooth beneath near the base; median area of clypeus transversely concave, glabrous, impunctate, the posterior margin of the glabrous area evenly arcuate; antennal tubercles prominent, strongly elevated; scape as above, the dorsal surface with small, dense punctures and sparse, erect, fuscous pubescence; first segment of flagellum slightly but distinctly shorter than the second; antennal scrobes distinctly carinate above; ocellar area elevated, the ocelli as above; front with moderate, close, confluent punctures; vertex with somewhat close, less confluent punctures than on the front; genae with moderate, shallow, separated punctures intermixed with fine, shallow punctures; relative widths of head and thorax including the tegulae, 6.2:8.0.

Thorax entirely black, the pronotum, propleura, and anterior fourth of the mesonotum with sparse, erect, pale fuscous pubescence, the remainder of thorax with sparse, erect, fulvo-fuscous pubescence; pronotum, mesonotum and scutellum with moderately large, dense, confluent punctures; mesonotum with a median, glabrous, longitudinal line on the anterior half, the parapsidal furrows present, strong and deep on the posterior

half of mesonotum; scutellum strongly convex; enclosed space of dorsum of propodeum subtriangular, about as long as it is broad at the base; dorsum and posterior face of propodeum with very large, dense, more or less confluent punctures, approaching reticulate; propleura with scattered punctures; dorsal and ventral areas of mesopleura separated by a distinct furrow; mesopleura micropunctate throughout, and also with moderate, close punctures except on the anterior fourth; metapleura glabrous and micropunctate except ventrally with moderately large, close punctures and dorsally somewhat transversely rugose; sides of propodeum shallowly, narrowly reticulate except the anterior fourth glabrous and micropunctate; mesosternal tubercles well developed, transverse; tegulae large, strongly convex, glabrous, impunctate except narrow anterior and inner margins punctate and pubescent.

Abdomen fulvous, except the first segment and the disk of the second sternite black, clothed with erect, fulvous pubescence, except that on the first segment and second sternite pale, the distal fringe of the first tergite and the second sternite fulvous like the remaining tergites and sternites; first tergite with moderately large, more or less close punctures except the distal margin with fine, close punctures; disk of second tergite glabrous, sparsely punctate, the punctures moderate and becoming dense toward the margins except those towards the distal margin small and close; tergites three to six with moderate, close punctures distally; glabrous, impunctate area of last tergite strongly elevated posteriorly and terminating in the arms of a prominent Y-shaped carina, the stem of the Y slightly longer than the arms; distal margin of last tergite biemarginate; first sternite with a median, longitudinal carina on the anterior two-thirds, the carina slightly elevated anteriorly and posteriorly; second sternite with large, distinct punctures, the latter somewhat smaller and sparser towards the distal margin; sternites three to six with moderate, close punctures towards the distal margin; sixth and seventh sternites with a pair of moderate, distinct, lateral tubercles; hypopygium with a pair of prominent, lateral carinae, the latter dentiform posteriorly, that is, terminating in a distinct tooth.

Wings fuliginous; cell 2nd $R_1 + R_2$ subtruncate at the apex; cell R_5 receiving vein M_{3+4} slightly beyond the middle; cell R_4 present and receiving vein M_2 three-fifths the distance from base to apex.

Legs entirely black, clothed with sparse, pale pubescence, the latter slightly tinged with fulvous; intermediate coxae with a strong, prominent tooth at the inner, distal margin; calcaria pale.

Holotype.—Male, Huntley, Montana, August 23, 1915, in University of Minnesota collection.

Related to *grotei* Blake but differs in having larger ocelli, the hypopygial carinae dentiform posteriorly, more uniformly punctate second sternite, the black disk of second sternite and pale fuscous pubescence of the head and pronotum. It differs from the male of *suspensa* subsp. *sonora* in the larger ocelli, darker pubescence of the head and pronotum, the greatly dilated scape with its dense brush of pubescence and the less developed lateral tubercles of the seventh sternite.

Timulla (Timulla) suspensa subsp. *suspensa* (Gerstaecker). (New combination)

1874. *Mutilla suspensa* Gerstaecker, Archiv. f. Naturg., xl, p. 299, female.

1894. *Mutilla suspensa* Cameron, Biol. Centr.-Amer., Hymen., ii, p. 268, female.

1897. *Mutilla suspensa* Dalla Torre, Cat. Hymen., viii, p. 89, female.

1903. *Mutilla suspensa* André, Gen. Ins., i, fasc. 11, p. 42, female.

Type.—Female, Mexico (Koppe), in Zoological Museum der Universität, Berlin.

Specimens examined.—

ARIZONA: female, Santa Rita Mts., July (F. H. Snow); female, Chiricahua Mts., August 5, 1932 (D. K. Duncan).

Timulla (Timulla) suspensa subsp. *sonora* n. subsp.

Female.—Head, thorax and legs ferruginous, abdomen ferruginous beneath, more or less blackish above; first and second tergites with distal bands, the second also with a pair of lateral stripes extending from base to apex, of appressed, pale pubescence; scutellar scale broad and distinct; mesonotal-scutellar suture distinct; pygidium irregularly rugose on the basal half, the distal half granulate. Length, 9.5 mm.

Head ferruginous; front and vertex with sparse, erect and recumbent, fulvous hairs, the genae with sparse, pale hairs; mandibles edentate, black distally; clypeus elevated, the elevated area smooth, polished, the elevated margin not dentate

laterally, the posterior area punctate and pubescent; first segment of flagellum one and one-half times longer than the second; antennal scrobes very weakly carinate above; front and vertex coarsely, densely, confluent punctate, the genae with close, moderate punctures; relative widths of head and thorax, 3.5:3.2.

Thorax ferruginous; dorsum clothed with sparse, erect and recumbent, fulvous hairs, the posterior face of propodeum with sparse, pale, erect hairs; humeral angles rounded; thorax not broader behind than in front, the mesonotal area distinctly constricted; dorsum and upper half of posterior face of propodeum very coarsely, densely, confluent punctate, more so than the front, the punctures coarser and deeper towards the rear; lower half of posterior face of propodeum with sparse, small punctures, the lateral margins dentate; scutellar scale broad and distinct; mesonotal-scutellar suture distinct; anterior margin of propleura defined by an obscure carina; propleura with a few punctures at the anterior angle; remainder of pro-, meso-, and metapleura smooth, shining, micropunctate, with fine, pale pubescence; sides of propodeum with close, almost confluent, large punctures posteriorly.

Abdomen ferruginous beneath, blackish above; first tergite ferruginous, with large, scattered punctures, sparse, erect, pale hairs, and a distal band of appressed, pale pubescence; second tergite with large, rather close punctures, indistinctly visible through the pubescence, with a pair of rather broad stripes extending from base to apex, lateral margins, and a broad, distal band of appressed, pale pubescence; tergites three to five each with a pair of quadrate, lateral spots of appressed, pale pubescence, those on tergite five almost meeting medially at the distal margin; pygidium irregularly rugose on the proximal half, granulate distally; first sternite with an anterior, small tubercle; second sternite with large, close punctures; sternites two to five finely, densely punctate at the distal margin, and each with a thin distal fringe of pale hairs.

Legs ferruginous, sparsely clothed with pale hairs; calcaria pale.

Male.—Head, thorax, first abdominal segment, second sternite except lateral and distal margins, and legs, all black; remainder of abdomen fulvous; mandibles emarginate beneath and with a prominent tooth beneath near the base; scape moderately dilated distally and with a thin brush of pale pubescence on the distal half beneath; vertex and pronotum clothed with

sparse, pale pubescence; last abdominal tergite with a median, glabrous, elongate area terminating in a Y-shaped carina; lateral tubercles of seventh tergite well developed and conspicuous; lateral carinae of hypopygium dentiform posteriorly. Length, 17 mm.

Head entirely black, clothed with sparse, long, erect, and short, appressed, pale pubescence, except the posterior area of front and anterior area of vertex with sparse, erect, fuscous pubescence; mandibles edentate and with a distinct tooth within remote from the apex, the dorsal surface with a strong, prominent carina, strongly emarginate beneath and with a prominent tooth beneath near the base; median, glabrous area of clypeus subrectangular, transversely concave, the postero-lateral angles rounded and slightly reflexed; scape as above, the dorsal surface with small, dense punctures and sparse, pale fuscous pubescence; front, vertex and genae with moderate, more or less confluent punctures; ocelli moderate in size, the distance between the eye margins and the lateral ocelli equal to three times the greatest diameter of the latter; relative widths of head and thorax including the tegulae, 5.5:7.2.

Thorax entirely black, clothed with sparse, long, erect, pale pubescence, except the pronotum and anterior third of mesonotum also with sparse, appressed, pale pubescence, and the remainder of the mesonotum as well as the anterior half of the scutellum with sparse, long, erect, blackish pubescence; pronotum, mesonotum and scutellum with moderately large, dense, confluent punctures; mesonotum with a median, longitudinal, glabrous line on the anterior half; parapsidal furrows present and distinct, strong and deep on the posterior two-thirds; scutellum strongly convex; enclosed area of propodeum elongate, the sides sinuate, about twice as long as it is wide at the base; dorsum and posterior face of propodeum narrowly reticulate; propleura irregularly punctate with fine and moderate punctures; dorsal and ventral areas of mesopleura separated by a furrow, with moderate, dense, confluent punctures, except the anterior fifth glabrous, micropunctate; metapleura micropunctate except ventrally with moderate, close punctures and dorsally transversely rugose; sides of propodeum narrowly reticulate, glabrous and micropunctate at the anterior margin; mesosternal tubercles prominent and transverse; tegulae large, convex, glabrous and impunctate except the anterior and inner margins punctate and black pubescent.

Abdomen fulvous, except the first segment and the most of the second sternite black, clothed with sparse, fulvous pubescence, except the black areas with sparse, erect, pale pubescence, the apical fringe of the first tergite fulvous; first tergite with moderate, distinct punctures, the latter becoming smaller at the distal margin; second tergite with moderate, distinct punctures, becoming dense and somewhat confluent anteriorly and laterally, smaller and shallower distally; tergites three to six with moderately small, close, more or less confluent punctures, the latter becoming small and sparse at the distal margin; median glabrous area of last tergite terminating in the elevated arms of a Y-shaped carina, the arms and the stem of the Y about equal in length; first sternite with a median, longitudinal carina on the anterior two-thirds, the carina elevated at its proximal and distal ends; second sternite with moderately large, close, distinct punctures, the latter sparse along the mid line and on the broad, depressed, distal margin; sternites three to six with moderate, close punctures distally; sixth sternite with a pair of weak, lateral tubercles; seventh sternite with a pair of well-developed, conspicuous, lateral tubercles; hypopygium with a pair of prominent lateral carinae dentiform at the distal end.

Wings fuliginous; cell 2nd $R_1 + R_2$ subtruncate at the apex; cell R_5 receiving vein M_{3+4} three-fifths the distance from the base to apex; cell R_4 present and receiving vein M_2 five-eighths the distance from base to apex.

Legs entirely black, sparsely clothed with pale hairs; inner distal margin of intermediate coxae with a well-developed, conspicuous tooth; calcaria pale.

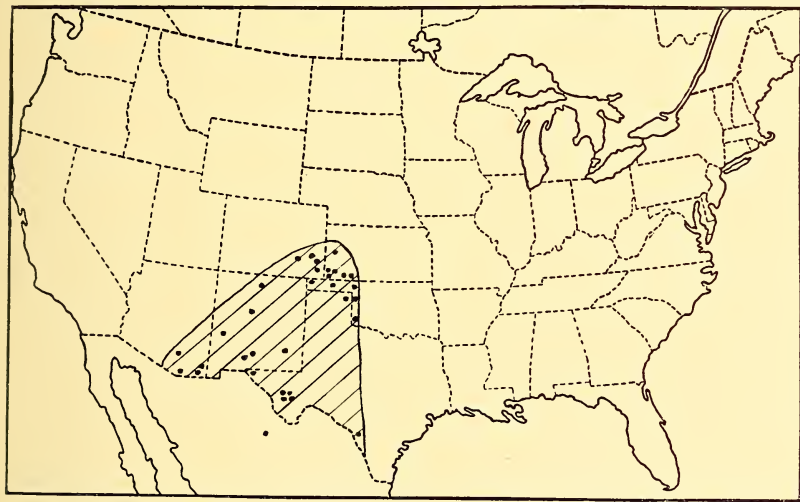
Holotype.—Female, Cat. No. 50948 U. S. National Museum, Mesilla Park, New Mexico (Cockerell).

Allotype.—Male, Marathon, Texas, June 7, 1908 (Mitchell and Cushman), in United States National Museum.

PARATYPES.—Female, Douglas, Arizona, July 20, 1933 (W. W. Jones); female, Douglas, Arizona, July 22, 1933 (W. W. Jones); female, Douglas, Arizona, August 1, 1933 (W. W. Jones); male, Douglas, Arizona, August 2, 1933 (W. W. Jones); male and female, Douglas, Arizona, August 4, 1933 (W. W. Jones); four males, Douglas, Arizona, August 7, 1933 (W. W. Jones); male, Douglas, Arizona, August 8, 1928 (W. W. Jones); two females, Douglas, Arizona, August 21, 1934 (W. W. Jones); male and female (in copula), Douglas, Arizona, August 22, 1933 (W.

W. Jones); female, Douglas, Arizona, September 1, 1933 (W. W. Jones); two males, Douglas, Arizona, September 20, 1933 (W. W. Jones); female, Douglas, Arizona, October 3, 1933 (W. W. Jones); female, Douglas, Arizona, October 6, 1933 (W. W. Jones); male, Douglas, Arizona, October 8, 1927 (W. W. Jones); female, Douglas, Arizona, October 11, 1933 (W. W. Jones); female and two males, Douglas, Arizona, August (F. H. Snow); three males, Douglas, Arizona, San Bernardino Ranch, August (F. H. Snow); female, Douglas, Arizona (W. W. Jones); female, Huachuca Mts., Arizona, August; female, male, Huachuca Mts., Arizona; male and female (in copula), Huachuca Mts., Arizona; female, Tucson, Arizona, September 1, 1925; female, Tucson, Arizona, October, 1926 (F. Nichols); male, San Bernardino Ranch, Cochise County, Arizona, August (F. H. Snow); female, Gila Valley, Arizona, July 20, 1933 (F. H. Parker); female, Gila Valley, Arizona, July 29, 1933 (F. H. Parker); female, Gila Valley, Arizona (D. K. Duncan); six males, Arizona; female, Mesilla Park, New Mexico, October 1, 1899 (Cockerell); female, Mesilla Park, New Mexico, September 12 (Cockerell); female, College farm, Mesilla Park, New Mexico, July 18 (Cockerell); female, San Augustine, New Mexico, August 29; female, Organ Mts., New Mexico, September 2; male, Roswell, New Mexico, June 26, 1932 (R. H. Beamer); male, El Rito, New Mexico, August 5; male, Albuquerque, July 17, 1902 (Oslar); male and female, New Mexico; female, Lamar, Colorado, July 18, 1901; three males, Two Buttes, Colorado, August 1, 1933 (Rodeck and James); male, Eads, Colorado, July 29, 1933 (Rodeck and James); male, Rocky Ford, Colorado, July 9, 1904; male, Wichita County, Kansas (F. X. Williams); eight males, female, Grant County, Kansas, July 23, 1911 (F. X. Williams); male, Grant County, Kansas, July 27, 1911 (F. X. Williams); female, Seward County, Kansas, August 18, 1911 (F. X. Williams); male, Seward County, Kansas, August 16, 1911 (F. X. Williams); three females, five males, Meade County, Kansas, July 10, 1911 (F. X. Williams); female, two males, Meade County, Kansas, July 12, 1911 (F. X. Williams); two females, Meade County, Kansas (S. J. Hunter); seven females, three males, Stanton County, Kansas, July 30, 1911 (F. X. Williams); two females, male, Stanton County, Kansas (S. J. Hunter); seven females, ten males, Morton County, Kansas, August 5, 1911 (F. X. Williams); male, Morton County, Kansas, June, 1902 (F. H. Snow); male and female, western Kansas; male, western Kansas, August 1, 1877; male, Laverne, Oklahoma, August 4, 1933 (E. E. Ivy); male, Vinson, Oklahoma, July 9, 1934 (J. Stankavich); male,

Shattuck, Oklahoma, August 12, 1933 (E. E. Ivy); male, Shattuck, Oklahoma, August 14, 1933 (Reynold Dahms); male, Kenton, Oklahoma, June 26, 1933 (E. E. Ivy); male, Kenton, Oklahoma, June 26, 1933 (A. E. Pritchard); female, Optima, Oklahoma, July 23, 1933 (E. E. Ivy); female, El Paso, Texas, July 24, 1914 (J. C. Bradley); two males, Musquiz Canyon, Ft. Davis, Texas, July 6, 1917; male, Valentine, Texas, July 3, 1933 (S. E. Jones); two males, Valentine, Texas, July 8, 1917; male, Valentine, Texas, July 7, 1917; two females, Cherry Canyon, Fort Davis Quad, Davis Mts., Texas, June 28–29, 1916 (F. M. Gaige); male, Childress, Texas, June 8, 1906 (J. B. Mitchell); male, Marfa, Texas, June 8, 1908 (Mitchell and Cushman); female, Alpine, Texas, June 28–30 (Wickham); female, Chisos Mts., Texas, July 16, 1911 (H. A. Wenzel); female, Dimmit County, Texas, June 10, 1933 (S. E. Jones).



Distribution of *Timulla* (*Timulla*) *suspensa* subsp. **sonora** n. subsp.

I have compared female specimens of this subspecies with the holotype of *suspensa* Gerstaecker and find the only difference is in the color of the legs, in subspecies *suspensa* black, and in subspecies *sonora* ferruginous; in pattern of pubescence, sculpture and punctuation of body the two are identical; the color of the abdomen of the female varies from distinctly black to distinctly ferruginous; the series before me includes many intergrades between the two; the male is almost identical with the male of *cyllene* Cameron, differing in having the second sternite black. The two sexes were taken in

copula at Douglas, Arizona, by Mr. W. W. Jones. The close relationship of this female to *suspensa* Gerstaecker and of the male to *cyllene* Cameron leads me to the belief that the latter two are sexes of the same species, as mentioned above. The females vary in length from 8 to 13 mm., the males from 14 to 19 mm. The male has been misidentified in collections as *oajaca* Blake.

Timulla (Timulla) suspensa subsp. **jonesi** n. subsp.

Male.—Head, thorax, first abdominal segment and legs entirely, black; remainder of abdomen fulvous and clothed with fulvous pubescence; mandibles strongly emarginate beneath and with a conspicuous tooth beneath near the base; median, glabrous area of clypeus transversely concave, the posterior elevated margin arcuate, and the postero-lateral borders slightly reflexed; scape with a single carina beneath, moderately dilated distally and with a thin brush of pale hairs beneath on the distal half; ocelli small, the distance between the eye margins and the lateral ocelli equal to slightly more than three times the greatest diameter of the latter; head clothed with sparse, pale pubescence, except the posterior part of front and anterior part of vertex including the ocellar area with sparse, black, erect pubescence; thorax clothed with pale pubescence, moderately dense on the pronotum except the posterior two-thirds of mesonotum and anterior, median half of scutellum with sparse, erect, black pubescence; mesosternal tubercles transverse; first abdominal segment with sparse, erect, pale hairs and a distal fringe of fulvous pubescence; median, elongate, glabrous area of last tergite terminating in the arms of a Y-shaped carina, the arms of the Y equal in length to the stem; sixth sternite with obscure, lateral tubercles; seventh sternite with distinct lateral tubercles; hypopygium with a pair of lateral, slightly oblique carinae, dentiform distally; wings fuliginous throughout; middle coxae with a distinct tooth at the apex within; legs clothed with sparse, pale pubescence.

Holotype.—Male, Douglas, Arizona, July 19, 1933 (W. W. Jones), in University of Minnesota collection.

Paratypes.—Male, Douglas, Arizona, August 7, 1933 (W. W. Jones); male, Douglas, Arizona, August 22, 1933 (W. W. Jones); male, San Bernardino Ranch, Douglas, Arizona, August (F. H. Snow); male, San Antonio, Texas, October 13, 1905 (F. C. Pratt); male, Victoria, Texas, August 3, 1906 (J. D. Mitchell); male, (Texas); male, Victoria, June 19, 1913 (J. D. Mitchell); male, Bexar County, Texas, September 23, 1934 (H. B. Parks).

Closely related to the male of subsp. *sonora* but differs in having the second abdominal sternite entirely ferruginous, the somewhat more dense, pale pubescence of the pronotum, and the slightly less reflexed postero-lateral angles of the clypeal glabrous area. Also similar to *cyllene* (Cameron) from Mexico but the latter has the postero-lateral angles of the clypeal glabrous area strongly reflexed and subangulate.

Timulla (Timulla) ocellaria subsp. **ocellaria** n. sp. and n. subsp.

Male.—Head, thorax, first abdominal segment, and legs, entirely black; abdomen beyond the first segment ferruginous; mandibles emarginate beneath and with a distinct tooth beneath near the base; median area of clypeus subtriangular, only very slightly concave medially; ocelli very large, conspicuous, the distance between the eye margins and the lateral ocelli slightly less than the greatest diameter of the latter; median, glabrous area of last tergite terminating in the arms of a Y-shaped carina; fifth and sixth sternites without lateral tubercles; seventh sternite with a pair of almost obsolete lateral tubercles; hypopygium with a pair of low, inconspicuous, lateral, oblique carinae on the proximal half; wings fuscous throughout. Length, 14 mm.

Head entirely black, clothed throughout with sparse, pale, glittering pubescence; mandibles edentate at the tip and with a distinct tooth within near the tip, the dorsal surface with a high, prominent, longitudinal carina, emarginate beneath and with a distinct tooth beneath near the base; median area of clypeus subtriangular, glabrous, impunctate, except the anterior margin and the posterior angle punctate and pubescent; scape distinctly bicarinate beneath, clothed with sparse, pale pubescence; first segment of flagellum equal in length to the second when viewed from beneath; antennal scrobes carinate above; front and vertex and genae with moderate, close punctures interspersed with fine punctures, the moderate punctures on the genae more distinct and separated than on the front and vertex; ocelli as above; relative widths of head and thorax at the tegulae, 4.85:7.0.

Thorax entirely black, sparsely clothed with pale, glittering pubescence, except the pronotum, mesonotum and scutellum with sparse, erect, fuscous to black pubescence; pronotum, mesonotum and scutellum with moderately large, dense, more or less confluent punctures; parapsidal furrows distinct the entire

length of mesonotum, but somewhat deeper posteriorly than anteriorly; dorsum of propodeum with an elongate, narrow, triangular enclosed space, the sides of the latter sinuate; dorsum and posterior face of propodeum rather deeply reticulate; propleura with moderately large, close punctures, except the posterior border glabrous, micropunctate; ventral and dorsal areas of mesopleura separated by a slightly oblique furrow, with moderately large, close, somewhat confluent punctures, except at the anterior margin glabrous and micropunctate; metapleura glabrous, micropunctate except for moderate punctures ventrally; sides of propodeum reticulate, the reticulations becoming shallow and obsolete towards the anterior margin; tegulae large, convex, glabrous, impunctate, except the anterior and inner margins punctate and black pubescent; mesosternum not tuberculate.

Abdomen ferruginous, except the first segment black; first and second tergites and all the sternites with sparse, erect, pale, glittering pubescence, the remainder of the tergites with sparse, erect, pale fuscous pubescence, except the first tergite with a thin, distal fringe of black hairs, tergites two, three and four with broad, distal, marginal bands of black pubescence, tergites five and six with sparse, scattered black hairs, and sternites two to six with very thin, distal fringes of fuscous to black hairs; first tergite with large, distinct punctures, except the narrow, distal margin with small, close punctures; second tergite with separated, distinct, moderate punctures on the disk, sparse medially, becoming close and adjacent at the sides, and the broad, distal margin with small, close punctures; tergites three to six with moderate, distinct punctures anteriorly, becoming smaller and closer towards the distal margin; median, glabrous area of last tergite terminating in the arms of a Y-shaped carina, the arms of the Y shorter than the stem; first sternite with a median, longitudinal carina on the anterior three-fourths; second sternite with large, distinct punctures somewhat closer at the sides than at the middle and becoming moderate and close at the distal margin; sternites three to six with moderate, close punctures distally; fifth and sixth sternites without lateral tubercles; seventh sternite with a pair of almost obsolete lateral tubercles; hypopygium with a pair of low, inconspicuous, lateral oblique carinae on the proximal half.

Wings fuscous throughout; cell 2nd $R_1 + R_2$ subtruncate at the apex; cell R_5 receiving vein M_{3+4} almost two-thirds the dis-

tance from base to apex; cell R_4 distinct and receiving vein M_2 almost two-thirds the distance from base to apex; vein m-cu received by cell Cu distinctly anterior to vein $M_4 + Cu_2$.

Legs entirely black, sparsely clothed with erect and appressed, pale, glittering pubescence; intermediate coxae with a small tubercle at the inner posterior margin; calcaria pale.

Holotype.—Male, Knoxville, Tennessee, August 16, 1927, in University of Minnesota collection.

Paratypes.—Male, Knoxville, Tennessee, July 11, 1928; two males, Knoxville, Tennessee, July 12, 1928; male, Knoxville, Tennessee, July 18, 1928, at light; two males, Knoxville, Tennessee, July 24, 1928, at light; male, Knoxville, Tennessee, July 25, 1928, at light; male, Knoxville, Tennessee, July 27, 1927; male, Knoxville, Tennessee, July 30, 1928, at light; male, Knoxville, Tennessee, August 2, 1927; male, Knoxville, Tennessee, August 9, 1927; male, Knoxville, Tennessee, August 14, 1928, at light; two males, Knoxville, Tennessee, August 21, 1928, at light; male, Knoxville, Tennessee, August 23, 1928, at light; two males, Knoxville, Tennessee, August 28, 1928, at light; male, Knoxville, Tennessee, August 30, 1927; male, Knoxville, Tennessee, September 10, 1928, at light; male, Knoxville, Tennessee, September 13, 1928, at light; male, Knoxville, Tennessee, September 28, 1927; male, Knoxville, Tennessee, September 30, 1927; male, Knoxville, Tennessee, October 14, 1928, at light; male, Knoxville, Tennessee, October 15, 1928, at light; male, Knoxville, Tennessee (G. G. Ainslie); male, Columbus, Ohio, July 13, 1930 (Charles H. Hicks); male, Borden, Indiana, July 16–18, 1913 (Harold Morrison).

Very similar in appearance to *hollensis* subsp. *melanderi* but differs in the mandibles being excised and toothed beneath and the extremely large ocelli. This species is evidently more or less nocturnal since most of the paratypes were taken at light at Knoxville, Tennessee. The paratypes vary in length from 10 to 16 mm.

Timulla (Timulla) ocellaria subsp. *rufidorsa* n. subsp.

1916. *Mutilla (Timulla) sayi* Bradley, Trans. Amer. Ent. Soc., xlii, p. 214, male (nec Blake).

Male.—Head, thorax except the prothorax, mesonotum and tegulae, first abdominal segment, and legs, all black; prothorax, mesonotum and abdomen beyond the first segment, all ferruginous; tegulae dark ferruginous; mandibles emarginate beneath and with a distinct tooth beneath near the base; median area of clypeus subtriangular, only slightly concave medially; scape

bicarinate beneath; ocelli very large, the distance between the eye margins and the lateral ocelli slightly less than the greatest diameter of the latter; median, glabrous area of last tergite terminating in the arms of a Y-shaped carina; fifth and sixth sternites without lateral tubercles; seventh sternite with a pair of almost obsolete, lateral tubercles; hypopygium with a pair of low, oblique, inconspicuous carinae on the proximal half; wings fuscous throughout; calcaria pale. Length, 13 mm.

Holotype.—Male, Cat. No. 50950 U. S. National Museum Durant, Oklahoma, July 1, 1910, at light (Hunter).

Paratypes.—Male, Baldwin, Kansas, July 31, 1906 (Bridwell), two males, Seward County, Kansas, August 16, 1911 (F. X. Williams); four males, Kansas; male, Durant, Oklahoma, July 1, 1910, at light (Hunter); male, Payne County, Oklahoma, July 1, 1926 (W. J. Brown); male, Paris, Texas, September 30, 1904; male, October 9, 1904; two males, Paris, Texas; two males, Corsicana, Texas, July 19, 1905 (Hunter); male, Dallas, Texas, October 4, 1905 (C. R. Jones); two males, Terrell, Texas, June 19, 1904, at light; male, Columbia, Missouri, July 13, 1905; male, Columbia, Missouri, July 22, 1905; three males, Columbia, Missouri, July 29, 1905; male, Columbia, Missouri, September 2, 1905; male, Missouri; male, Agricultural College, Mississippi, June 10, 1913 (J. G. Hester); male, Agricultural College, Mississippi, May 11, 1922 (S. F. Crawford).

Exactly like *ocellaria* subsp. *ocellaria* except the prothorax and the mesonotum ferruginous with pale pubescence, and the tegulae dark ferruginous. Similar in appearance to *sayi* Blake with which it has been confused, but differs in the mandibles excised and toothed beneath, in the slightly larger ocelli, in the thorax being much less ferruginous and in the darker wings. This subspecies is also more or less nocturnal as several of the paratypes have been taken at light.

Timulla (Timulla) kansana n. sp.

Male.—Head entirely, thorax except pronotum, mesonotum and tegulae, first abdominal segment, and legs, all black; prothorax, mesonotum, tegulae, and abdomen except first segment, ferruginous; narrow, thin, distal fringe of first tergite, band at distal margin of second and third tergites, and scattered hairs at distal fringe of fourth and fifth tergites, black; remainder of abdominal pubescence pale and glittering; mandibles emarginate beneath and with a distinct tooth beneath near the base; median area of clypeus subtriangular, slightly concave medially; ocelli small; enclosed area of dorsum of propodeum small

and inconspicuous; last abdominal tergite with the median, elongate, glabrous area terminating in the arms of a Y-shaped carina, the arms distinctly shorter in length than the stem; hypopygium with a pair of distinct, lateral, oblique carinae on the proximal half; seventh sternite with a pair of obscure, lateral tubercles; fifth and sixth sternites without lateral tubercles; wings subfuscous. Length, 11 mm.

Head entirely black, sparsely clothed throughout with pale, glittering pubescence, somewhat thicker on the front; mandibles edentate at the apex and with a tooth within near the apex, with a prominent longitudinal carina on the dorsal aspect, emarginate beneath and with a distinct tooth beneath near the base; median area of clypeus subtriangular, mostly glabrous, the anterior margins and posterior angle punctate, the glabrous area slightly concave medially; scape bicarinate beneath, sparsely clothed with pale, glittering pubescence; first segment of flagellum slightly shorter than the second; antennal scrobes carinate above; front, vertex and genae with moderate, close, more or less confluent punctures, closer and more confluent on the front than elsewhere, and a small, glabrous, impunctate area present behind each lateral ocellus; ocelli small, the distance between the eye margins and the lateral ocelli about equal to three times the greatest diameter of the latter; relative widths of head and thorax at the tegulae, 4.0: 5.2.

Thorax black, except the prothorax and mesonotum, ferruginous, and the tegulae dark ferruginous; thorax clothed with sparse, pale, glittering pubescence, except the posterior five-sixths of mesonotum with very sparse, blackish pubescence; pronotum, mesonotum and scutellum with moderately large, dense, confluent punctures; scutellum slightly convex; enclosed area of dorsum of propodeum small, elongate, subtriangular, inconspicuous; dorsum and posterior face of propodeum deeply, narrowly reticulate; propleura micropunctate throughout, and indistinctly, moderately punctate posteriorly; ventral and dorsal areas of mesopleura separated by a transverse furrow, with moderate, close, more or less confluent punctures, except a narrow area adjacent to the anterior margin only micropunctate; metapleura glabrous, micropunctate and with a few moderate punctures ventrally; sides of propodeum with large, close punctures, approaching reticulate, except the anterior margin only micropunctate; mesosternum without well-defined tubercles; tegulae large, convex, glabrous, impunctate, except the anterior and inner margins punctate and blackish pubescent.

Abdomen ferruginous, except the first segment entirely black, clothed throughout with sparse, mostly erect, pale, glittering pubescence, except the thin, distal fringe of the first tergite, a broad band of erect pubescence at the distal margin of the second and third tergites, and a very thin, distal fringe on the fourth and fifth tergites, all black; first tergite with moderately large, distinct punctures becoming small and close at the distal margin; second tergite with moderate, distinct punctures, very close distally and laterally, somewhat separated on the disk; tergites three to six with moderate, distinct, close punctures, the latter even somewhat confluent laterally; median, elongate, glabrous area of last tergite terminating in the arms of a high, sharp, Y-shaped carina, the arms of the Y distinctly shorter than the stem; first sternite with a median, longitudinal carina on the anterior three-fourths; second sternite with large punctures, distinct and separated medially, close and somewhat confluent laterally; sternites three to six with moderately small, close punctures at the posterior margin; fifth and sixth sternites without lateral tubercles; seventh sternite with obscure lateral tubercles; hypopygium with a pair of lateral, oblique carinae on the proximal half.

Wings subfuscous throughout; cell 2nd $R_1 + R_2$ subtruncate distally; cell R_5 receiving vein M_{3+4} slightly beyond the middle; cell R_4 present but much less distinct than R_5 and receiving vein M_2 at the middle.

Legs black, sparsely clothed with erect, pale, glittering pubescence; intermediate coxae not toothed within but with a small tubercle at the inner posterior margin; calcaria pale.

Holotype.—Male, McPherson County, Kansas, June 27, 1923 (Clarence Bare), in University of Kansas collection.

Paratypes.—Male, Riley County, Kansas, September 11 (J. B. Norton); male, Riley County, Kansas, September 21 (E. E. Faville); male, Riley County, Kansas, October 1 (E. E. Faville).

Similar in appearance to *ocellaria* subsp. *rufidorsa* but differs in the much smaller ocelli and the paler pubescence of the abdomen. Also very similar in appearance to *sayi* Blake but differs in having the mandibles emarginate and toothed beneath and in the much smaller ocelli.

Timulla (*Timulla*) *sayi* (Blake). (New combination)

1871. *Mutilla Sayi* Blake, Trans. Amer. Ent. Soc., iii, p. 229, male.

1886. *Mutilla Sayi* Blake, Trans. Amer. Ent. Soc., xiii, p. 197, male.
1897. *Mutilla sayi* Dalla Torre, Cat. Hymen., viii, p. 84, male.
1899. *Mutilla Sayi* Fox, Trans. Amer. Ent. Soc., xxv, p. 271, male (in part).
1903. *Mutilla Sayi* André, Gen. Ins., i, fasc. 11, p. 42, male.
1916. *Mutilla (Timulla) hexagona* Bradley, Trans. Amer. Ent. Soc., xlii, p. 213, male (Texas specimens only).

Type.—Male, Texas, in collection of American Entomological Society, Philadelphia.

Specimens examined.—

TEXAS: male, Plano, July (E. S. Tucker); two males, Plano, August (E. S. Tucker); male, Plano, October (E. S. Tucker); six males.

Several species have been confused by previous writers under the name *sayi*; the latter is characterized by very large ocelli, so large that the space between the eye margins and the lateral ocelli is reduced to a distance equal to or slightly less than the greatest diameter of the lateral ocelli. Only one other species has such large ocelli, namely, *ocellaria*, which has even larger ocelli and which has the mandibles strongly excised and toothed beneath. *Ocellaria* subsp. *rufidorsa* is superficially very much like *sayi* but the two are easily separated by the structure of the mandibles. The above specimens have been compared with Blake's type and are identical with it. I have only seen specimens from Texas.

***Timulla (Timulla) suhhyalina* n. sp.**

1899. *Mutilla Sayi* Fox, Trans. Amer. Ent. Soc., xxv, p. 271, male (in part, Colorado and Montana specimens).
1903. *Mutilla Sayi* Melander, Trans. Amer. Ent. Soc., xxix, p. 324, male (in part, Nebraska specimens).
1916. *Mutilla (Timulla) hexagona* Bradley, Trans. Amer. Ent. Soc., xlii, p. 213 (in part, Colorado and Montana specimens).

Male.—Ferruginous, except the head, mesosternum and ventral area of mesopleura, first abdominal segment, and legs, all black; mandibles not excised beneath nor toothed near the base beneath; median area of clypeus triangular, very slightly concave; ocelli moderately large, the distance between the eye margins and the lateral ocelli equal to about one and one-fourth times the greatest diameter of the latter; mesosternum not

tuberculate; median, glabrous area of last tergite terminating in a Y-shaped carina, the arms of the Y distinctly shorter than the stem; fifth and sixth sternites without lateral tubercles; seventh sternite with the lateral tubercles practically obsolete; hypopygium with a pair of obscure, oblique carinae on the anterior half; wings subhyaline. Length, 11 mm.

Head entirely black, clothed throughout with sparse, long and erect, as well as short and appressed, pale pubescence; mandibles edentate at the apex, with a distinct tooth within near the apex, the dorsal face with a distinct, longitudinal carina, and not at all excised nor toothed beneath; median area of clypeus triangular, glabrous except the anterior margin and posterior angle punctate and pale pubescent, slightly concave medially; scape distinctly bicarinate beneath; first and second segments of flagellum approximately equal in length; antennal scrobes carinate above; front, vertex and genae with moderate punctures thickly interspersed with fine punctures, the front and vertex with the moderate punctures close, the genae with the same punctures distinctly separated; ocelli as above; relative widths of head and thorax at the tegulae, 4.1 : 5.2.

Thorax ferruginous, except the ventral area of mesopleura and the mesosternum, black, clothed throughout with sparse, erect, pale pubescence, that on the mesonotum and scutellum tinged with ferruginous; pronotum, mesonotum and scutellum with moderate, dense, confluent punctures; parapsidal furrows distinct throughout, though somewhat deeper posteriorly than anteriorly; enclosed area of dorsum of propodeum elongate, triangular, the sides slightly sinuate; dorsum and posterior face of propodeum distinctly, shallowly reticulate; propleura with moderate, sparse punctures interspersed with very fine punctures; ventral and dorsal area of mesopleura separated by a furrow, with moderately large, close punctures interspersed with very fine punctures; metapleura micropunctate except ventrally with moderate, close punctures, the ventral margin tinged with black; sides of propodeum shallowly reticulate, the meshes smaller and less distinct than elsewhere on the propodeum, almost shallowly, closely punctate, and with an obscure dark, oblique line at the region of the spiracle; tegulae ferruginous, large, convex, glabrous, the anterior half and inner margin punctate and pale pubescent.

Abdomen ferruginous, except the first segment blackish, clothed with sparse, pale pubescence, except the first, second and

third tergites with black pubescence at the distal margins, that on the first tergite a narrow fringe, that on the second and third tergites broad bands; first tergite with moderately large, close punctures, the latter becoming small at the distal margin; second tergite with moderate, distinct, separated punctures, sparser on the disk than laterally or anteriorly and becoming small at the distal margin; tergites three to six with moderate, distinct punctures, the latter closer laterally than medially; median, elongate, glabrous area of last tergite as above; first sternite with a median, longitudinal carina on the anterior three-fourths, elevated anteriorly and posteriorly; second sternite with moderately large, distinct, close punctures, the distal margin with small punctures; sternites three to six with moderately small, close punctures towards the distal margin; fifth and sixth sternites without lateral tubercles; seventh sternite with practically obsolete lateral tubercles; hypopygium with a pair of obscure, oblique carinae on the anterior half.

Wings subhyaline; cell 2nd $R_1 + R_5$ subtruncate at the apex, approximately equal in length to cell $R + 1st R_1$; cell R_5 receiving vein M_{3+4} at half the distance from base to apex; cell R_4 present but less distinct than R_5 and receiving vein M_2 at eight-thirteenths the distance from base to apex; vein m-cu received by cell Cu slightly before the apex.

Legs entirely black, sparsely clothed throughout with pale pubescence; calcaria pale.

Holotype.—Male, LeSeuer County, Minnesota, September 2, 1923 (Wm. E. Hoffmann), at light, in University of Minnesota collection. Paratypes.—

ILLINOIS: male, Lake Forest, August 22, 1906 (J. G. Needham).

IOWA: male, Ames.

MINNESOTA: male, St. Paul, August 16, 1930 (Dwight Buchanan).

NORTH DAKOTA: male, Fargo, July 7, 1919 (O. A. Stevens); three males, Medora, August 3, 1923 (O. A. Stevens); male, Beach, August 15, 1921 (C. N. Ainslie).

SOUTH DAKOTA: male, Lake Albert, August 22, 1923; male, Castle Rock, September 8, 1927 (H. C. Severin); male, Platte, July 20, 1923 (C. N. Ainslie); male, Nowlin County; two males.

NEBRASKA: male, Plattsmouth, September 3, 1923 (C. B. Philip); male, West Point, June 24; male, West Point, July, 1887.

KANSAS: male, Riley County, June (Marlatt); male, Decatur County (F. X. Williams); male, Norton County, August 24, 1912 (F. X. Williams); male, Cheyenne County (F. X. Williams); male, Scott City, August 21 (Lantz).

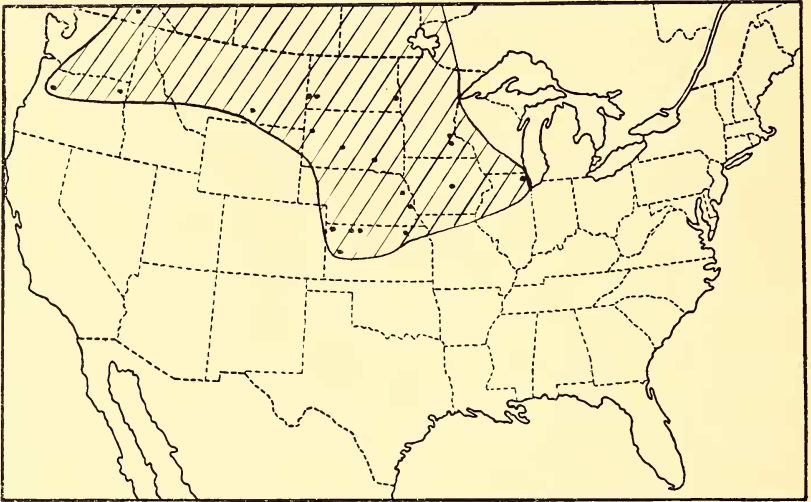
COLORADO: seventeen males.

MONTANA: male, Huntley, July 23, 1917; two males, Huntley, August 23, 1915; six males.

OREGON: male, Union, September 1, 1896 (C. V. Piper); male, Corvallis, July 20, 1925 (D. A. Wilbur); male, Corvallis, August 16, 1925 (D. A. Wilbur).

BRITISH COLUMBIA: male, Vernon, July 25, 1917 (Sladen).

Without locality data: twenty-eight males.



Distribution of *Timulla (Timulla) subhyalina* n. sp.

This species has been incorrectly identified in the past as *hexagona* Say and has also been confused with *sayi* Blake. Superficially it appears much like *sayi*, but has smaller ocelli, much paler wings, and almost entirely ferruginous thorax. It is easily recognized by these three characters. In the seventy-six specimens ranging in distribution from Illinois, Minnesota and Kansas to Oregon and British Columbia, which have been examined, there is almost no variation in the color of the thorax or in the transparency of the wings, and while there is some variation in the size of the ocelli, it is slight and they are always distinctly smaller than in *sayi*. One specimen from Corvallis, Oregon, has the ocelli moderate in size; space between eye margins and lateral ocelli equal to one and one-half times the diameter of the latter; the other has the ocelli large, *i.e.*, the two dimensions approximately equal; otherwise the two specimens are identical. Although previous workers have believed this species to be the

same as Say's *hexagona*, that view is not tenable, since Say described the latter as having the thorax entirely black and the wings fuliginous. The specimens range in length from 9 to 16 mm.

Timulla (Timulla) hollensis subsp. *hollensis* (Melander). (New combination)

1903. *Mutilla Sayi* var. *hollensis* Melander, Trans. Amer. Ent. Soc., xxix, p. 324, male.

1916. *Mutilla (Timulla) hexagona* Bradley, Trans. Amer. Ent. Soc., xlii, p. 213, male (in part).

Type locality, Wood's Hole, Massachusetts. Location of type unknown.

Specimens examined.—

MASSACHUSETTS: male, Nantucket, September 9; male, Nantucket, September 10; two males, Nantucket, September 12.

NEW YORK: male, Cold Spring Harbor, Long Island, August 4, 1921 (E. G. Anderson); male, Yaphank, Long Island, September 22, 1911; male, Yaphank, Long Island, October 11, 1913.

MARYLAND: male, Frederickstown.

Without data: male.

Very similar in appearance to *sayi* Blake from Texas, but differs in the fuscous to black color of the pubescence of the vertex, mesonotum and scutellum, the tegulae conspicuously darker in color than the mesonotum, and the smaller ocelli.

Timulla (Timulla) hollensis subsp. *melanderi* n. subsp.

1916. *Mutilla (Timulla) hexagona* Bradley, Trans. Amer. Ent. Soc., xlii, pp. 213–214, male (in part).

Male.—Head, thorax, first abdominal segment, and legs, entirely black; remainder of abdomen ferruginous; head and thorax clothed with sparse, pale pubescence, except the mesonotum and anterior portion of scutellum with sparse, black pubescence; thin, apical fringe of first abdominal tergite black; second tergite with a broad, distal band of sparse, black pubescence; third and fourth tergites sparsely black pubescent distally; remaining tergites with mostly pale pubescence; distance between eye margins and lateral ocelli approximately one and one-half times the greatest diameter of the latter; mandibles not excised beneath; wings dark fuscous. Length, 13 mm.

Holotype.—Male, Falls Church, Virginia, August 7 (Nathan Banks), in collection Cornell University, Ithaca, New York.

Paratypes.—Male, Falls Church, Virginia, September 4, 1915 (C. T. Greene); male, Plummer's Island, Maryland, August 5, 1914 (R.

C. Shannon); male, Baltimore, Maryland, July, 1909; male, Clemen-ton, New Jersey, July 29, 1900 (G. M. Greene); male, Gloucester County, New Jersey, September 7, 1890; male, Philadelphia, Penn-sylvania, August 17, 1891; male, Enola, Pennsylvania, August 20, 1910 (W. S. Fisher).

Exactly like subsp. *hollensis* except the thorax entirely black, and the vertex and posterior part of scutellum with pale pubescence.

Timulla (Timulla) dubitatiformis n. sp.

1909. *Mutilla (Timulla) briarus* Rohwer, Trans. Amer. Ent. Soc., xxxv, pp. 132-133, female (not male).

1909. *Mutilla (Timulla) dubitatiformis* mss. Rohwer, Trans. Amer. Ent. Soc., xxxv, p. 133, female.

Female.—Ferruginous, the flagellum and legs blackish, broad distal margin of the first and second abdominal tergites, and exposed areas of tergites three to five, all black; first tergite with a narrow, distal band of black pubescence; second tergite with a narrow, distal band narrowly dilated at the anterior mid-dle, of dense, glittering, pale pubescence; tergites three to five with distal bands of dense, glittering, pale pubescence, that on the third interrupted medially; lateral margins of thorax slightly but distinctly emarginate medially; thorax not broader posteriorly than anteriorly; scutellar scale obscure, almost obso-lete; mesonotal-scutellar suture obscure; pygidial area weakly, longitudinally rugose, the surface granulate throughout. Length, 9 mm.

Head ferruginous, the flagellum blackish, slightly tinged with ferruginous; tips of mandibles black; front and vertex with sparse, erect and recumbent, ferruginous pubescence, else-where the head with sparse, pale, glittering pubescence; man-dibles slender, edentate at the tips and with a slight tooth within near the apex; posterior margin of clypeus strongly, arcuately elevated, the elevated margin obscurely serrate; surface of clypeus anterior to elevated margin concave, glabrous; clypeus with a small, distinct, median tubercle immediately posterior to the elevated margin; antennal tubercles approximate; first seg-ment of flagellum slightly shorter than segments two and three united; antennal scrobes distinctly carinate above; front and vertex with moderate, dense, confluent punctures; genae with moderate, close punctures interspersed with very fine punc-tures; relative widths of head and thorax, 3.8:3.5.

Thorax entirely ferruginous, the dorsum clothed with sparse,

erect and recumbent, ferruginous pubescence, elsewhere with sparse, pale, glittering pubescence, that on the pleural areas appressed; lateral margins of dorsum of thorax slightly but distinctly emarginate; humeral angles broadly rounded; scutellar scale obscure, almost obsolete; mesonotal-scutellar suture obscure; dorsum of thorax with moderately large, dense, confluent punctures, the latter somewhat larger than on the front and vertex; dorsum and posterior face of propodeum reticulate, the posterior half of the latter only very faintly reticulate; lateral margins of posterior face of propodeum slightly crenulate; pleural areas micropunctate and micropubescent; sides of propodeum with small, scattered punctures as well as micropunctate.

Abdomen ferruginous, except the distal margin of the first tergite, broad, distal margin of second tergite, and exposed areas of tergites three to five, all black; first tergite with a narrow, distal band of black pubescence; tergites two to five with pale, glittering pubescence at the distal margin as described above; first tergite with moderate, separated punctures interspersed with fine punctures, clothed with sparse, erect, pale pubescence except at the distal margin; lateral areas of second tergite with moderate, distinct punctures, the posterior third dilated at the anterior middle with fine, close punctures, clothed with sparse, erect and recumbent, dark ferruginous pubescence, the recumbent pubescence black in certain lights, and both erect and recumbent pubescence becoming pale and glittering towards the lateral margins; distal margin of second tergite with a pale pubescent band as described above; tergites three to five with fine, close punctures and sparse, erect and recumbent, dark pubescence except the distal bands as mentioned above; pygidial areas as described above; first sternite with a median, longitudinal carina on the anterior two-thirds; second sternite with moderate, distinct punctures interspersed laterally and posteriorly with fine punctures; sternites three to five with small, close punctures towards the distal margin; hypopygium with small, close punctures; all the sternites with sparse, pale, glittering pubescence, and sternites two to five each with a thin, distal fringe of pale pubescence.

Legs very dark ferruginous, more or less blackish; coxae, and femora beneath distinctly ferruginous; tibial spines ferruginous; legs clothed throughout with sparse, pale pubescence; calcaria pale.

Holotype.—Female, Cat. No. 18463 U. S. National Museum, Boulder, Colorado, May 26, 1908 (T. D. A. Cockerell).

Paratypes.—

MASSACHUSETTS: female, Nantucket, September 13, 1927 (C. W. Johnson).

CONNECTICUT: female, Lyme, May 13, 1911 (A. B. Champlain).

NEW YORK: female, Orient, Long Island, May 22, 1933 (Roy Latham); female, Riverhead, Long Island, July 1, 1933 (Roy Latham); female, Riverhead, Long Island, August 7, 1933 (Roy Latham); female, Sag Harbor, Long Island, May 6, 1932 (Roy Latham); female, Calverton, Long Island, June 19, 1932 (Roy Latham); two females, Cold Spring Harbor, Long Island, June 17, 1923 (E. G. Anderson); female, Cold Spring Harbor, Long Island, June 22, 1921 (E. G. Anderson); three females, Cold Spring Harbor, Long Island, June 27, 1921 (E. G. Anderson); female, Cold Spring Harbor, Long Island, June 27, 1921 (S. H. Emerson); female, Cold Spring Harbor, Long Island, August 9, 1921 (S. H. Emerson); female, Cold Spring Harbor, Long Island, September 13, 1922 (E. G. Anderson).

NEW JERSEY: female, Cold Spring, July 14, 1903.

MARYLAND: female, Chesapeake Beach, July 27, 1913 (R. C. Shannon); female, College Park, August 23, 1925 (C. E. Green); female, Beltsville, July 4, 1912 (W. L. McAtee); female, Plummer's Island, June 11 (H. S. Barber).

VIRGINIA: female, Arlington, May 15, 1925 (D. H. Blake); female, Clifton, May, 1933 (J. C. Bridwell); female, East Falls Church, June 18, 1912; female, Falls Church, August 2; female, Falls Church, August 4 (Nathan Banks); female, Falls Church, September 1, 1915 (C. T. Greene); female, Gunston Cove, June 4, 1922 (Budlong and Barber).

OHIO: female, Athens, July 29, 1932 (W. C. Stehr); female, Columbus, April 13, 1902 (Bridwell).

GEORGIA: female, Stone Mountain, August 16, 1913.

FLORIDA: female, Orange County, June 24, 1929 (A. J. Wafford).

MISSISSIPPI: female, Agricultural College, April 21, 1918 (R. G. Prescott); female, Agricultural College, April 25, 1917 (E. E. Johnson); female, Agricultural College, May 6, 1922 (H. G. Miller); female, Agricultural College, May 22, 1922 (Hewes); female, Agricultural College, July 8, 1913 (J. G. Hester); female, Agricultural College, July 11, 1913 (T. F. McGehee); female, Agricultural College, July 22, 1922 (W. C. Avens); female, Agricultural College, September 21 (S. R. Evans).

LOUISIANA: two females, New Orleans.

MISSOURI: female.

IOWA: female, Iowa City (Wickham); female, Ames, August 18, 1926; female, Sioux City, September 5, 1927 (C. N. Ainslie).

MINNESOTA: female, Fridley Sand Dunes, Anoka County, June 19, 1926 (R. W. Dawson).

SOUTH DAKOTA: female, Medicine Lake, Florence, June 23, 1927 (H. C. Severin); three females.

NEBRASKA: female, Plattsmouth, September 3, 1923 (C. B. Philip); two females, Lincoln, June 21, 1912 (E. J. Taylor); female, Lincoln, September 9, 1924 (R. W. Dawson); female, West Point; female, Scribner, June 18, 1913 (L. T. Williams).

KANSAS: female, Riley County, June 24 (Popenoe); female, Riley County, July 24 (G. A. Dean); female, Riley County (F. Marlatt); female, Baldwin, May (Bridwell); female, Baldwin, June (Bridwell); female, Baldwin, July 14, 1906 (J. C. Bridwell); female, Baldwin, August 5, 1906 (J. C. Bridwell); female, Baldwin, August 16, 1906 (J. C. Bridwell); two females, Clay County, August, 1901 (Bridwell); female, Douglas County, May 21, 1922 (W. J. Brown); female, Ottawa, July 13, 1923 (W. J. Brown); female, Emporia, August 7, 1932 (R. C. Smith); female, Sumner County (R. H. Beamer); two females, Rawlins County (F. X. Williams).

OKLAHOMA: female, Norman, April 11, 1932 (J. Smith).

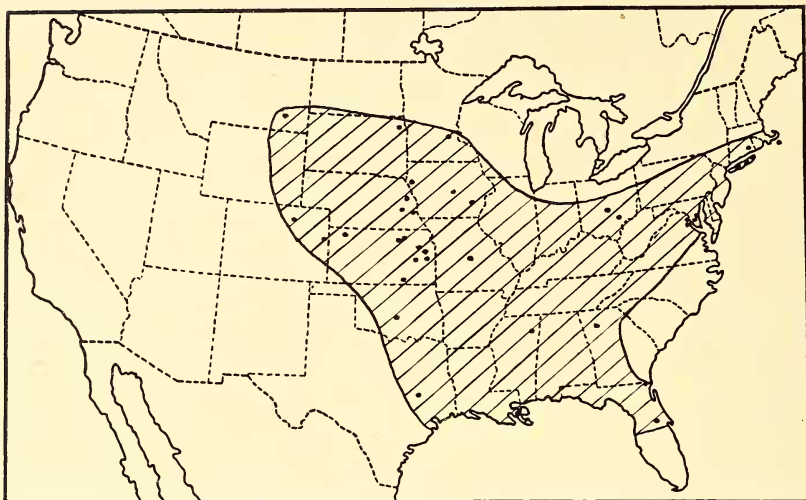
TEXAS: female, Madison County, August 22, 1932 (F. F. Bibby); two females.

COLORADO: female, Burlington, July 26, 1933 (Rodeck and James); female, Ft. Collins: two females.

MONTANA: female, Forsyth.

Without data: two females.

Dubitatiformis differs from all other female *Timullas* north of Mexico except *euterpe* and *euphrosyne* in the distal black pubescent band of the first abdominal tergite. It is readily distinguishable from the two latter species by the dusky to black color of the last three abdominal tergites, and the pale pubescent markings of the same tergites. The almost obsolete scutellar scale and the absence of pale pubescent markings on the anterior half of the second abdominal tergite are additional characters which are of aid in identification. The paratypes vary in length from 5 to 10 mm.; the color of the terminal abdominal segments varies from black to ferruginous, but they are clothed with pale pubescence, not with fulvous as in *euterpe* and *euphrosyne*.

Distribution of *Timulla (Timulla) dubitatiformis* n. sp.

This female has an exceptionally wide distribution and no male of which the female is unknown has a similar distribution. I am of the opinion that one or all of the group of males including *rufosignata*, *tolerata*, *subhyalina*, *hollensis* subsp. *hollensis*, *hollensis* subsp. *melanderi*, and *sayi* represent the male sex. All of these have a more limited distribution than *dubitiformis*, and I have attempted without success to find some basis for separating the latter into geographical groups which could be correlated with the above males. The situation may be that the males have differentiated into geographical groups, while the females have remained stable; this has been found to be true of certain other species of Mutillidae both in the United States and the Philippine Islands. All that can be said at present is that the male will probably prove to be among those mentioned above.

This female was recognized by Rohwer as new as early as 1909, and specimens were labeled by him as *dubitiformis* mss. Later Rohwer came to the conclusion that *dubitiformis* mss. was the female sex of *briaxus* Blake and published a description of his specimen under the name *briaxus*. Through an oversight the name "*dubitiformis*" was not changed to "*briaxus*" in the last paragraph of his discussion (p. 133). Specimens of *briaxus* Blake (= *vagans* Fabr.) taken in copula with females have demonstrated that the latter are entirely different from Rohwer's *dubitiformis* mss., thus leaving the species without a valid name. In order to

avoid confusion I have used Rohwer's manuscript name *dubitiformis* and based the description on the specimen selected and labeled by him as the holotype specimen. I am indebted to Mr. S. A. Rohwer and Miss Grace Sandhouse for the information regarding the manuscript name *dubitiformis* and the specimens on which it was based.

Timulla (Timulla) contigua n. sp.

Female.—Head, thorax, first abdominal segment except posterior half of tergite, and anterior two-thirds of second abdominal segment, all ferruginous, the remainder of abdomen, antennae and legs, black; head and dorsum of thorax contiguously but not coarsely punctured; scutellar scale entirely absent; sides of dorsum of thorax distinctly but weakly emarginate medially; second abdominal tergite finely punctured throughout, without anterior, pale pubescent spots; pygidium faintly, longitudinally rugose anteriorly, granulate posteriorly. Length, 9 mm.

Head ferruginous, the antennae and tips of mandibles black, clothed with scattered, erect, fuscous hairs, and sparse, recumbent, ferruginous pubescence, except that on the genae, pale; mandibles edentate at the tips and with a small tooth within near the apex; clypeus strongly elevated posteriorly, the elevated margin strongly arcuate, slightly dentate at the lateral extremities and narrowly emarginate medially; antennal tubercles approximate medially; antennal scrobes distinctly carinate above; front, vertex and genae with moderate punctures, the latter close and confluent immediately behind the antennal scrobes, distinct and contiguous on the front and vertex, separated and interspersed with fine punctures at the posterior margin of vertex and on the genae; relative widths of head and thorax, 3.4:3.1.

Thorax entirely ferruginous, clothed with sparse, recumbent, ferruginous pubescence on the dorsum, with sparse, erect, pale hairs on the posterior face of propodeum and pale micropubescence on the pleural areas; thorax subrectangular, elongate, the width in relation to length, 3.1:5.5, the lateral margins of the dorsum distinctly but shallowly emarginate medially; relative widths of thorax at humeral angles, middle of prothorax, anterior spiracles, middle of mesothorax, posterior spiracles and at dorsum of propodeum, 2.6:3.1:2.7:2.6:2.8:3.1; humeral angles rounded; dorsum of thorax with moderate, contiguous

punctures anterior to the mesonotal-scutellar suture, coarsely punctured merging into reticulate posterior to the latter; scutellar scale entirely absent; lateral margins of posterior face of propodeum denticulate; propleura micropunctate and with obscure, moderate, shallow punctures; meso- and metapleura micropunctate and with moderate, shallow, close punctures.

Abdomen black, except anterior half of first tergite, first sternite entirely, anterior two-thirds of second segment, and the last two sternites, all ferruginous; first tergite with an inconspicuous, pale pubescent band at the posterior margin, second tergite with a broad, conspicuous band of pale pubescence at the posterior margin, the anterior margin of the band strongly, narrowly, angulately dilated medially; tergites three to five each with a band of pale pubescence at the posterior margin not interrupted medially, that on the third tergite most prominent; all the sternites with fringes of pale hairs at the posterior margin; second tergite with fine, distinct punctures interspersed with scattered, small punctures, the fine punctures becoming obsolete on the antero-lateral areas; tergites three to five with fine, distinct punctures interspersed with scattered, small punctures; pygidium faintly, longitudinally rugose anteriorly, granulate posteriorly; first sternite with a strong, longitudinal, median carina on the anterior half; second sternite with moderately small punctures on the disk, becoming interspersed with fine, distinct punctures at the lateral and posterior margins; sternites three to five with moderately small, close punctures posteriorly; last sternite with moderately small, dense punctures.

Legs entirely black, clothed with sparse, pale pubescence; calcaria pale.

Holotype.—Female, Brownsville, Texas, May 25, 1934 (J. N. Knull), in collection of Ohio State University, Columbus, Ohio.

Paratype.—Female, Texas.

Superficially resembles *dubitatiformis* but the thorax is more elongate, the scutellar scale is lacking, the front, vertex and dorsum of thorax are much less coarsely punctured, the punctures moderate and contiguous, not dense and confluent, and the first tergite with the posterior, marginal pubescent band pale instead of black. Also resembles *cuphrosyne* in the color, puncturation and pattern of the second abdominal tergite, but that species has the head and thorax much more strongly punctured, the pubescent band at the posterior margin of the first tergite black, and has the last three abdominal

segments entirely ferruginous and clothed with ferruginous pubescence.

Timulla (Timulla) rufosignata (Bradley). (New combination)

1916. *Mutilla (Timulla) rufosignata* Bradley, Trans. Amer. Ent. Soc., xlii, p. 212, male.

Holotype.—Male, Everglade, Florida, April 11, 1912 (Wm. T. Davis), in collection of Cornell University, Ithaca, New York.

Specimens examined.—

GEORGIA: two males, Tifton.

FLORIDA: male, Gainesville, Alachua County, May 13, 1914; male (paratype).

Characterized by the very small ocelli, the mandibles not emarginate nor toothed beneath, the deeply, coarsely reticulated propodeum, and the ferruginous pronotum and mesonotum.

Timulla (Timulla) tolerata n. sp.

Male.—Black, except the pronotum, mesonotum, anterior margin of scutellum, tegulae, and abdomen beyond the first segment, ferruginous; mandibles not at all emarginate nor toothed beneath; median area of clypeus triangular; ocelli moderately small, the distance between the eye margins and the lateral ocelli equal to slightly more than twice the greatest diameter of the latter; propodeum moderately reticulate; mesosternum not tuberculate; median, elongate, glabrous area of last tergite terminating in a Y-shaped carina; fifth and sixth sternites without lateral tubercles; seventh sternite with the lateral tubercles almost obsolete; hypopygium with a pair of obscure, oblique carinae on the anterior half; wings fuscous throughout; legs clothed with black pubescence. Length, 12 mm.

Head black, the mandibles subterminally, vertex, and genae tinged with ferruginous, clothed with sparse, intermixed pale and fuscous pubescence; mandibles edentate at the apex and with a small tooth within near the apex, the dorsal aspect with a distinct, longitudinal carina, not at all emarginate nor toothed beneath; median area of clypeus triangular, the anterior margin and the posterior angle punctate, the remainder glabrous, impunctate; scape distinctly bicarinate beneath; first segment of flagellum approximately equal in length to the second; antennal scrobes carinate above; front, vertex and genae with moderate, close, more or less confluent punctures, the latter more separated on the genae, close and confluent on the front and vertex; ocelli as above; relative widths of head and thorax at the tegulae, 4.05 : 5.00.

Thorax black, except the pronotum, mesonotum, anterior margin of scutellum and tegulae, all ferruginous and the remainder of scutellum tinged with ferruginous; pronotum, mesonotum and scutellum with moderate, dense, confluent punctures, clothed with sparse, erect, fuscous pubescence; enclosed area of dorsum of propodeum elongate, subtriangular; dorsum and posterior face of propodeum distinctly but moderately reticulate, clothed with sparse, erect, pale pubescence; propleura obscurely punctate, clothed with sparse, pale pubescence; ventral and dorsal areas of mesopleura separated by a deep furrow, with moderate, close punctures interspersed with fine, shallow punctures, and clothed throughout with sparse, pale pubescence; metapleura glabrous, micropunctate and micropubescent except ventrally with moderate, close punctures; sides of propodeum reticulate, the meshes small, almost reduced to large, shallow punctures; mesosternum not tuberculate; tegulae large, convex, glabrous, the anterior half with scattered, setigerous punctures, the hairs black.

Abdomen ferruginous except the first segment entirely black and the distal margins of the second and third tergites infuscated, blackish; first and second segments clothed with sparse, erect, pale pubescence, the broad, distal margin of the second tergite, the distal fringe of the second sternite and all the remaining segments with erect, black pubescence; first tergite with large, close punctures becoming small at the distal margin; second tergite with moderate, distinct punctures, more separated on the disk than laterally and becoming small at the distal margin; tergites three to five with moderately small, distinct, close punctures; last tergite with the median, elongate, glabrous area terminating in the arms of a Y-shaped carina, the arms of the Y shorter than the stem; distal margin of the last tergite strongly biemarginate; first sternite with a median, longitudinal carina on the anterior three-fourths; second sternite with moderate, distinct, more or less separated punctures, and small punctures at the distal margin; sternites three to six with moderately small, close punctures distally; fifth and sixth sternites without lateral tubercles; seventh sternite with obsolete, obscure, lateral tubercles; hypopygium with a pair of low, obscure, oblique carinae on the anterior half.

Wings fuscous throughout; cell $2nd\ R_1 + R_2$ subtruncate at the apex; cell R_5 receiving vein M_{3+4} five-ninths the distance from base to apex; cell R_4 present but less distinct than R_5 and

receiving vein M_2 almost two-thirds the distance from base to apex.

Legs entirely black, clothed with obscure, sparse, short, appressed, pale pubescence, and sparse, erect, black hairs; intermediate coxae with an obscure tubercle at the inner posterior margin; calcaria pale.

Holotype.—Male, Cat. No. 50952 U. S. National Museum, St. Louis, Missouri (Rau).

Resembles *rufosignata* Bradley but the ocelli are larger, the reticulation of the propodeum is much less deep and coarse, and the pubescence of the legs is black. *Tolerata* also resembles *sayi* Blake but the ocelli of the latter are much larger and more elevated, the distal margin of the second and third tergites is not infuscated, the punctuation of the thorax is denser, and the pubescence of the legs is pale.

LITERATURE CITED

- André, E. 1898. Étude sur les Mutillides du Muséum de Paris. Ann. soc. ent. France, lxxvii, pp. 1-79.
1903. Mutillidae. Genera Insectorum, i, fasc. 11, pp. 1-77.
- Ashmead, W. H. 1899. Super-families in the Hymenoptera and Generic Synopses of the Families Thynnidae, Myrmosidae, and Mutillidae. Journ. N. Y. Ent. Soc., vii, pp. 45-60.
1899. Hymenoptera; in John B. Smith's "Insects of New Jersey," p. 535.
- Blake, Charles A. 1871. Synopsis of the Mutillidae of North America. Trans. Amer. Ent. Soc., iii, pp. 217-265.
1879. Catalogue of the Mutillidae of North America, with descriptions of new species. Trans. Amer. Ent. Soc., vii, pp. 243-254.
1886. Monograph of the Mutillidae of North America. Trans. Amer. Ent. Soc., xiii, pp. 179-286.
- Bradley, J. C. 1916. A Revision of *Timulla* Ashmead, a Subgenus of *Mutilla* Equivalent to the Species Group *hexagona* of Fox. Trans. Amer. Ent. Soc., xlii, pp. 199-214.
- Cameron, P. 1894-1896. Biologia Centrali-Americana. Hymenoptera, ii, pp. 259-395.
- Cresson, E. T. 1865. Catalogue of Hymenoptera in the Collection of the Entomological Society of Philadelphia, from Colorado Territory. Proc. Ent. Soc. Phila., iv, pp. 428-442.
1887. Synopsis of the Families and Genera of the Hymenoptera

- of America, North of Mexico. Trans. Amer. Ent. Soc., Suppl. vol., pp. 106-107, 263-267.
- Dalla Torre, C. G. de. 1897. *Catalogus Hymenopterorum*, viii, pp. 1-99.
- Fabricius, J. C. 1798. *Supplementum entomologiae systematicae*, pp. 281-282.
1804. *Systema Piezatorum*, pp. 428-439.
- Fox, W. J. 1899. The North American Mutillidae. Trans. Amer. Ent. Soc., xxv, pp. 219-292.
- Gerstaecker, A. 1874. Mutillarum Americae meridionalis indigenarum synopsis systematica et synonymica. Arch. für Naturgeschichte, xl, pp. 41-77, 299-328.
- Howard, L. O. 1904. The Insect Book, pl. viii, fig. 21.
- Leonard, M. D. 1928. A List of the Insects of New York, p. 994.
- Lepelletier de Saint-Fargeau. 1845. *Histoire Naturelle des Insectes. Hyménoptères*, iii, pp. 589-646.
- Melander, A. L. 1903. Notes on North American Mutillidae, with Descriptions of New Species. Trans. Amer. Ent. Soc. xxix, pp. 291-330.
- Mickel, Clarence E. 1923. Preliminary Notes on the Mutillidae of Minnesota. 19th Report State Entomologist of Minnesota, pp. 97-113.
1928. Biological and Taxonomic Investigations of the Mutillid Wasps. Bull. 143, U. S. National Museum, pp. 1-351.
1933. The Mutillidae of Formosa. Ann. Ent. Soc. Amer., xxvi, pp. 381-423.
1934. Mutillidae of the Philippine Islands. The Philippine Journ. Sci., liv, pp. 91-218.
- Olivier, A. G. 1811. *Encyclopédie méthodique. Histoire naturelle. Insectes*, viii, pp. 51-66, 129-130.
- Provancher, L. 1887. Additions et Corrections au Volume ii de la faune entomologique du Canada traitant des Hyménoptères, pp. 249-253.
- Radoszkowski, O. 1885. Révision des armures copulatrices des mâles de la famille de Mutillides. Horae Soc. Ent. Rossicae, xix, pp. 3-47.
- Rohwer, S. A. 1909. New Hymenoptera from Western United States. Trans. Amer. Ent. Soc., xxxv, pp. 130-134.
- Say, Thomas. 1836. Descriptions of New North American Hymenoptera, and Observations on Some Already Described.

Bost. Journ. Nat. Hist., i, pp. 295-298. LeConte Ed., ii, pp. 738-741.

Smith, Frederick. 1855. Catalogue of Hymenopterous Insects in the Collection of the British Museum, pt. 3, pp. 1-63.

Viereck, H. L. 1909. Hymenoptera; in John B. Smith's "Insects of New Jersey," p. 665.

EXPLANATION OF PLATES

Last abdominal tergite of the males of *Timulla* in North America north of Mexico.

PLATE I

- Fig. 1. *Timulla (Timulla) ferrugata* (Fabricius).
Fig. 2. *Timulla (Timulla) ornatipennis* (Bradley).
Fig. 3. *Timulla (Timulla) barbata* (Fox).
Fig. 4. *Timulla (Timulla) oajaca* (Blake).
Fig. 5. *Timulla (Timulla) leona* (Blake).
Fig. 6. *Timulla (Timulla) dubitata* subsp. *fugitiva* n. subsp.

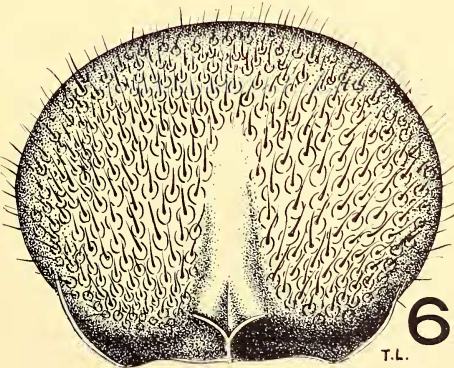
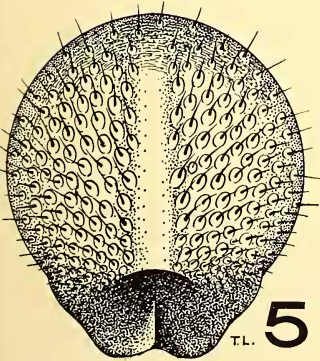
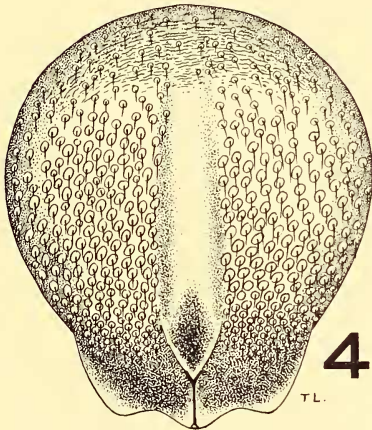
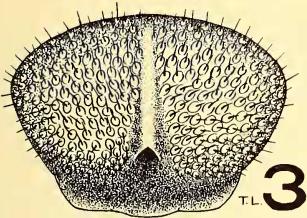
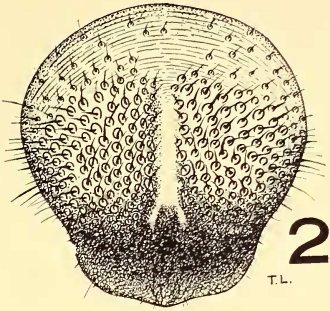
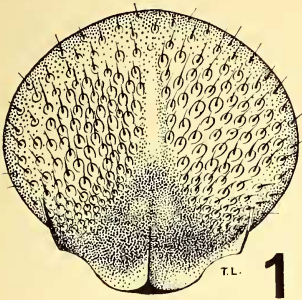


PLATE II

- Fig. 7. *Timulla* (*Timulla*) *navasota* subsp. *nebulosa* n. subsp.
Fig. 8. *Timulla* (*Timulla*) *floridensis* (Blake).
Fig. 9. *Timulla* (*Timulla*) *navasota* subsp. *nebulosa* n. subsp.
Profile, lateral view.
Fig. 10. *Timulla* (*Timulla*) *compressicornis* n. sp.
Fig. 11. *Timulla* (*Timulla*) *barbigera* subsp. *barbigera* (Bradley).
Fig. 12. *Timulla* (*Timulla*) *vagans* subsp. *vagans* (Fabricius).